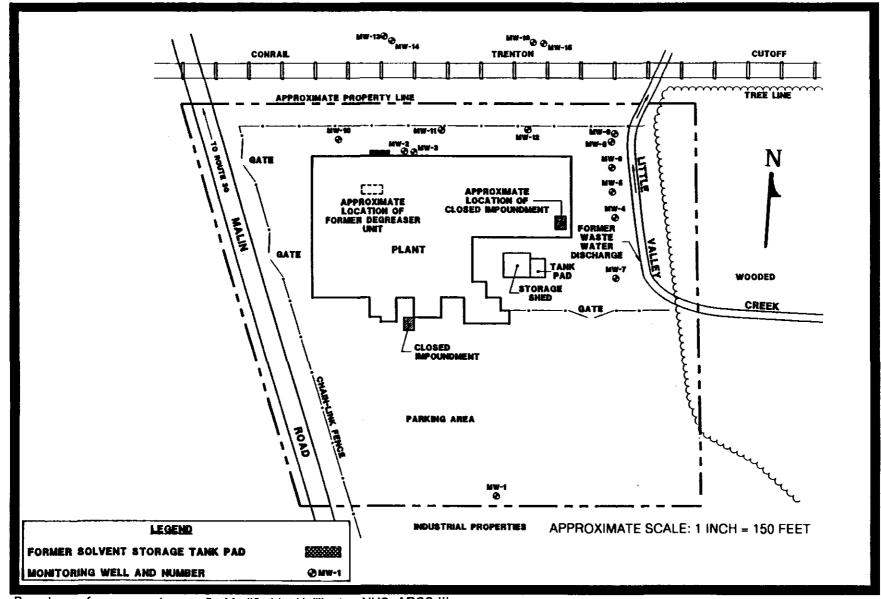
401692 ORIGINAL (Red)MI

REFERENCE NO. 5

1



Based on reference no. 4, page 5. Modified by Halliburton NUS, ARCS III.

SITE SKETCH
BISHOP TUBE COMPANY
FRAZER, CHESTER COUNTY, PENNSYLVANIA



MAY 1995



REFERENCE NO. 6

CHEMICAL REGULATION

\$	EPA Notification of	Hazardous Waste Site United States Environmental Projection Agency Washington DC 20460
	This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.	Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.
Ā	Person Required to Notify:	Tohnson Motth on To
	Enter the name and address of the person or organization required to notify.	Name Johnson Matthey Inc. V Street 4 Malin Road
		City Malvern State PA zip Code 19355
8	Site Location:	
	Enter the common name (if known) and actual location of the site.	Name of Site Bishop Tube Co. Street Route 30 and Malin Road
77	0-08-186-8309	City Malvern County Chester State PA Zip Code 19355
c	Person to Contact:	
	Enter the name, title (if applicable), and business tolephone number of the person	Name (Last First and Title) Curtis, Barbara Environ, Specialist
	to contact regarding information submitted on this form.	Phone (215) 648-8278
D	Dates of Waste Handling:	1969 sold to Whittaker Corp.
	Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.	From (Year) 1951 To (Year) 1979 - disposal ended by Bishop Tube C

Waste Type: Choose the option you prefer to complete

Option I: Select general waste types and source categories. If you do not know the general waste types or sources, you are ancouraged to describe the site in Item I-Description of Site.

General Type of Waste: Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

- 1.
 Organics
- 2. Inorganics
- 3.

 Solvents
- 4.
 Pesticides
- ☐ Heavy metals
- 6. CR Acids Bases
- B. C PCBs
- 9. Mixed Municipal Waste
- **2**√□ Unknown D Other (Specify)

334 THE	Toxic Metals
	/ IIIOses A Motole
-NOW EL	TOXIC MEDALS

Non	EP	Toxic	Metals

- 1.
 Mining
- 2. Construction

Source of Waste:

Place an X in the appropriate

- 3.
 Textiles
- 4. Fertilizer
- 5. D Paper/Printing
- 6. Leather Tanning
- 7. iii Iron/Steel Foundry
- 8. Chemical, General
- 9.

 Plating/Polishing 10.
 Military/Ammunition
- 11.

 Electrical Conductors
- 12.
 Transformers
- 13.
 Utility Companies
- 14
 Sanitary/Refuse 15 | Photofinish
- 16. 🗆 Lab 'Hospital

pickling

Unknown l Other (Specify) tainless Steel 18

Lorm Approved OMB No. 2006 0138

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 3001 regulations (40 CFR Part 261).

Specific Type of Waste:

EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter the appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site is located.

	i			i 1
				1
			1	
			1	
			1	
			ļ. i	
		į –		
)	
!	1	l l		i

ന

ĿIJ	RRENT REPORT		15 PSINI 75
	Notification of Hazardous Waste Site	Side Two	
-	Waste Quantity	Facility Type	Total Facility Waste Amount
	Place an X in the appropriate boxes to	1. Piles	cubic feet Note (A) Z
	indicate the facility types found at the site.	2. 🗆 Land Treatment	
	In the "total facility waste amount" space give the estimated combined quantity	3. 🗆 Landfill	gallons Note (A)
	(volume) of hazardous wastes at the site	4. 🗆 Tanks	Total Facility Area
	using cubic feet or gallons.	5. Impoundment	square foot 11,500.5
	In the "total facility area" space, give the estimated area size which the facilities	6) 🗷 Underground Injection 7. 🗆 Drums, Above Ground	
	occupy using square feet or acres.	8. Q Drums, Below Ground	to settling tanks and tile field system
		9.X Other (Specify)	system
,	Known, Suspected or Likely Releases	to the Environment:	
	Place an X in the appropriate boxes to indic or likely releases of wastes to the environm		□ Knowa □ Suspected □ Likely □ None Note (B)
	Note: Items Hand I are optional. Completin hazardous waste sites. Although completing		State and Lical governments in locating and assessing encouraged to do so
F	Sketch Map of Site Locations (Option	 -	
	Steach a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw on arrow showing the direction north. You may substitute a publishing map showing the site location.		
	1.000 gallons of h	dous by natural process azardous waste was distributed in the sale of the sale	scharged per year
	Description of Site: (Optional)		
	Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or flowing, Include such information as how waste was disposed and where the waste came from Provide any other information or comments which may help describe the site conditions.	•	
	(B) Unknown, no release observed or detect		from the above facility has been
			cessary to compile the foregoing ection and estimates of currently
1	Signature and Title: employed p	ersonnel.	
•	The person or authorized representative	Name Johnson Matthey	Tre
	(such as plant managers, superintendents,	Jointson Marchey	23 OWNER, Fresent
	trustees or attorneys) of persons required to notify must sign the form and provide a	Street 4 Malin Road	☐ Owner, Past
	mailing address (if different than address		☐ Transporter
	in item A). For other persons providing notification, the signature is optional.	cov Malvern	State PA zip Code 19355 De Operator, Present
	Check the boxes which best describe the relationship to the site of the person	11 111	□ Other
	required to notify. If you are not required	Signature for over y. Co	bula one 6/8/81
	to notify check "Other"	Howard S. Roberts	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Howard S. Roberts Senior Vice President

Notification of Hazardous Waste Site	Side Two		16/A
Waste Quantity	Facility Type	Total Facility	Waste Amount
Place an X in the appropriate boxes to	1. Pites	•	Note (R).
indicate the facility types found at the site.	2. Land Treatment	cubic feet	10000
In the "total facility waste amount" space	3. D Landfill	gallons	Note (A)
give the estimated combined quantity (volume) of hazardous wastes at the site	4. 🗖 Tanks	Total Facility	
using cubic feet or gallons.	impoundment	square feet	360 S
In the "total facility area" space, give the	6. ☑ Underground Injection 7. □ Drums, Above Ground		
estimated area size which the facilities occupy using square feet or acres.	8. Drums, Below Ground	acres	
	9. Other (Specify)		
Known, Suspected or Likely Releases t	o the Environment:		
Place an X in the appropriate boxes to indicat or likely releases of wastes to the environment			uspected I Likely I None ote (B)
Note: Items Hand I are optional. Completing hazardous waste sites. Although completing			ents in locating and assessing
Sketch Map of Site Location: (Optiona			
Sketch a map showing streets, bighways,	•••		
routes or other prominent lendmarks near			
the site. Place an Won the map to indicate the site location. Draw an arrow showing			
the direction north. You may substitute a			
adblishing map showing the site location.			
(A) The amount of hazardous	waste to be found at	the site is u	nknown due to
	lata as to the amount r	endered non-h	azardous by
the unavailability of d			
the unavailability of d	eximately 8,000 gallons	of acid wast	e was discharged
the unavailability of d natural process. Appro per year in a stream co	eximately 8,000 gallons	of acid wast	e was discharged
the unavailability of d	eximately 8,000 gallons	of acid wast	e was discharged
the unavailability of d natural process. Appro per year in a stream co	eximately 8,000 gallons	of acid wast	e was discharged
the unavailability of d natural process. Appro per year in a stream co	eximately 8,000 gallons	of acid wast	e was discharged
the unavailability of d natural process. Appro per year in a stream co	eximately 8,000 gallons	of acid wast	e was discharged
the unavailability of denatural process. Approper year in a stream converted water. Description of Site: (Optional) Describe the history and present	eximately 8,000 gallons ontaining 3.25 million	of acid wast gallons of no	e was discharged n-hazardous waste
the unavailability of denatural process. Approper year in a stream converted water. Description of Site: (Optional) Describe the history and present conditions of the site. Give directions to	oximately 8,000 gallons ontaining 3.25 million J. Bishop & Co. Pl	of acid wast gallons of no atinum Works	e was discharged n-hazardous waste opened the site in
the unavailability of description of Site: (Optional) Description of Site: (Optional) Description of the site Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such	J. Bishop & Co. Pl	of acid wast gallons of no acid wast no acid wast no acid wast no acid wast nged to Matth	e was discharged n-hazardous waste opened the site in ey Bishop, Inc. in
the unavailability of description of Site: (Optional) Description of Site: (Optional) Description of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed	J. Bishop & Co. Pl. 951. The name was challed.	of acid wast gallons of no acid wast no model to Matth old the Plant	e was discharged n-hazardous waste opened the site in ey Bishop, Inc. in as Bishop Tube Co
the unavailability of description of Site: (Optional) Description of Site: (Optional) Description of the site (Optional) Description of Site: (Optional)	J. Bishop & Co. Pl. 951. The name was challed the Whittaker Corpor	of acid wast gallons of no acid wast no more atinum works nged to Matth old the Plant ation on 31 M	e was discharged n-hazardous waste opened the site in ey Bishop, Inc. in as Bishop Tube Co arch, 1969. Whitte
the unavailability of department of the unavailable department of the unavaila	J. Bishop & Co. Pl. 951. The name was charged to the Whittaker Corporsold it to Christiana M	of acid wast gallons of no acid wast no matth old the Plant ation on 31 Metals on 7 Ja	e was discharged n-hazardous waste opened the site in ey Bishop, Inc. in as Bishop Tube Coarch, 1969. Whittenuary, 1974. The
the unavailability of department of natural process. Approper year in a stream converted water. Description of Site: (Optional) Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.	J. Bishop & Co. Pl. 951. The name was chaused to the Whittaker Corportion of the Whittaker Corportion it to Christiana Market is now called: Bi	atinum Works nged to Matth old the Plant ation on 31 M etals on 7 Ja shop Tube Co.	opened the site in ey Bishop, Inc. in as Bishop Tube Coarch, 1969. Whittenuary, 1974. The Division of
the unavailability of description of Site: (Optional) Description of Site: (Optional) Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.	J. Bishop & Co. Pl. 951. The name was changed it to Christiana Melant is now called: Bichristiana Metals Corp.	atinum Works nged to Matth old the Plant ation on 31 M etals on 7 Ja shop Tube Co. Matthey Bis	e was discharged n-hazardous waste opened the site in ey Bishop, Inc. in as Bishop Tube Coarch, 1969. Whittenuary, 1974. The Division of hop changed its name
the unavailability of description of Site: (Optional) I start the site and present conditions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.	J. Bishop & Co. Pl. 951. The name was chaused to the Whittaker Corportion of the Whittaker Corportion it to Christiana Market is now called: Bi	atinum Works nged to Matth old the Plant ation on 31 M etals on 7 Ja shop Tube Co. Matthey Bis on 1 April,	e was discharged n-hazardous waste opened the site in ey Bishop, Inc. in as Bishop Tube Coarch, 1969. Whittenuary, 1974. The Division of hop changed its nar 1980.
the unavailability of department of the site and describe the site and waste came from Provide any other information or comments which may help describe the site conditions.	J. Bishop & Co. Pl. 951. The name was charged it to Christiana McCorpor sold it to Christiana McCorpor is now called: BiChristiana McCarle McCorpor Matthey Bishop Scothe Whittaker Corpor sold it to Christiana McCarle Is Christiana McCarle Is Christiana McCarle Inc. Con Johnson Matthey Inc. Chazardous waste from	atinum Works nged to Matth old the Plant ation on 31 M letals on 7 Ja shop Tube Co. Matthey Bis on 1 April, the above fac	e was discharged n-hazardous waste opened the site in ey Bishop, Inc. in as Bishop Tube Coarch, 1969. Whitte nuary, 1974. The Division of hop changed its nar 1980. ility has been
the unavailability of denatural process. Approper year in a stream converted water. Description of Site: (Optional) Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, aprings, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.	J. Bishop & Co. Pl. 951. The name was charged it to Christiana McCorpor sold it to Christiana McCorpor is now called: BiChristiana McCarle McCorpor Matthey Bishop Scothe Whittaker Corpor sold it to Christiana McCarle Is Christiana McCarle Is Christiana McCarle Inc. Con Johnson Matthey Inc. Chazardous waste from	atinum Works nged to Matth old the Plant ation on 31 M letals on 7 Ja shop Tube Co. Matthey Bis on 1 April, the above fac	e was discharged n-hazardous waste opened the site in ey Bishop, Inc. in as Bishop Tube Coarch, 1969. Whitte nuary, 1974. The Division of hop changed its nar 1980. ility has been
the unavailability of department of the site and describe the site canditions and where the waste came from Provide any other information or comments which smay help describe the site conditions. Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which smay help describe the site conditions. (B) Unknown. No release of observed or detected, his discounted.	J. Bishop & Co. Pl. 951. The name was charged it to Christiana McCorpor sold it to Christiana McCorpor is now called: BiChristiana McCarle McCorpor Matthey Bishop Scothe Whittaker Corpor sold it to Christiana McCarle Is Christiana McCarle Is Christiana McCarle Inc. Con Johnson Matthey Inc. Chazardous waste from	atinum Works nged to Matth old the Plant ation on 31 M letals on 7 Ja shop Tube Co. Matthey Bis on 1 April, the above fac y of some rel	e was discharged n-hazardous waste opened the site in ey Bishop, Inc. in as Bishop Tube Coarch, 1969. Whitte nuary, 1974. The Division of hop changed its name 1980. Ility has been ease cannot be
the unavailability of described in a stream construction of Site: (Optional) Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which smay help describe the site conditions. (B) Unknown. No release of observed or detected, his discounted. In the abs	J. Bishop & Co. Pl. 951. The name was character to Christiana Metals Corporation to Johnson Matthey Bishop in Christiana Metals Corporation of the Whittaker Corp	atinum Works nged to Matth old the Plant ation on 31 M letals on 7 Ja shop Tube Co. Matthey Bis on 1 April, the above fac y of some rel-	e was discharged n-hazardous waste opened the site in ey Bishop, Inc. in as Bishop Tube Coarch, 1969. Whitte nuary, 1974. The Division of hop changed its nare 1980. Ility has been ease cannot be necessary to compile
the unavailability of denatural process. Approper year in a stream converted water. Description of Site: (Optional) Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which smay help describe the site conditions. (B) Unknown. No release of observed or detected, his discounted. In the abstitute the site foregoing data on the bases.	J. Bishop & Co. Pl. 951. The name was character to Christiana Metals Corporation to Johnson Matthey Bishop in Christiana Metals Corporation of the Whittaker Corp	atinum Works nged to Matth old the Plant ation on 31 M etals on 7 Ja shop Tube Co. Matthey Bis on 1 April, the above fac y of some rel it has been owledge, reco	e was discharged n-hazardous waste n-hazardous waste opened the site in ey Bishop, Inc. in as Bishop Tube Coarch, 1969. Whitte nuary, 1974. The Division of hop changed its nare 1980. Illity has been ease cannot be necessary to compillection and estimate of the compilation and estimate
the unavailability of dependent of the stream control of the stream conditions of the stream of the stream describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from Provide any other information or comments which may help describe the site conditions. (B) Unknown. No release of observed or detected, in discounted. In the absolute foregoing data on the base signature and Title: of current of current of the person or authorized representative	J. Bishop & Co. Pl. 951. The name was changed it to Christiana Metals Corports of the Whittaker Corports of the Matthewale Corports of the possibility of the personal known of the personal	atinum Works nged to Matth old the Plant ation on 31 M letals on 7 Ja shop Tube Co. Matthey Bis on 1 April, the above fac y of some rel it has been owledge, reco of Bishop Tube	opened the site in ey Bishop, Inc. in as Bishop Tube Co arch, 1969. Whitten arry, 1974. The Division of hop changed its nare 1980. ility has been ease cannot be necessary to compillection and estimate Co.
the unavailability of dependent of the stream continued of the stream describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from Provide any other information or comments which smay help describe the site conditions. (B) Unknown. No release of observed or detected, his discounted. In the absolute of the stream of the person or authorized representative (such as plant managers, superintendents.	J. Bishop & Co. Pl. 951. The name was character as the Whittaker Corporsold it to Christiana McPlant is now called: Bishop is the Whittaker Corporsold it to Christiana McPlant is now called: Bishop is the Johnson Matthey Inc. I hazardous waste from a lowever, the possibilities are of recorded data, as is of the personal knowledge of the personal knowledg	atinum Works nged to Matth old the Plant ation on 31 M letals on 7 Ja shop Tube Co. Matthey Bis on 1 April, the above fac y of some rel it has been owledge, reco of Bishop Tube	opened the site in ey Bishop, Inc. in as Bishop Tube Co arch, 1969. Whittenuary, 1974. The Division of hop changed its name 1980. Ility has been ease cannot be necessary to compillection and estimate Co.
the unavailability of department of the site and describe any other information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions. (B) Unknown. No release of observed or detected, he discounted. In the abstace of current the person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a	J. Bishop & Co. Pl. 951. The name was changed it to Christiana Metals Corports of the Whittaker Corports of the Matthewale Corports of the possibility of the personal known of the personal	atinum Works nged to Matth old the Plant ation on 31 M letals on 7 Ja shop Tube Co. Matthey Bis on 1 April, the above fac y of some rel it has been owledge, reco of Bishop Tube	opened the site in ey Bishop, Inc. in as Bishop Tube Co arch, 1969. Whittenuary, 1974. The Division of hop changed its name 1980. Illity has been ease cannot be necessary to compillection and estimate Co.
the unavailability of denatural process. Approper year in a stream converted water. Description of Site: (Optional) In the site and description and present conditions to the site and description and present conditions to the site and description and waste was disposed and where the waste came from. Provide any other information or comments which smay help describe the site conditions. (B) Unknown. No release of observed or detected, his discounted. In the absented foregoing data on the base of control of the site of current s	J. Bishop & Co. Pl. 951. The name was changed it to Christiana Metals Corports old it is now called: Bichristiana Metals old it is now called: Bichristiana Metals old is	atinum Works nged to Matth old the Plant ation on 31 M letals on 7 Ja shop Tube Co. Matthey Bis on 1 April, the above fac y of some rel it has been owledge, reco of Bishop Tub inc.	opened the site in ey Bishop, Inc. in as Bishop Tube Co arch, 1969. Whitten arrows a property of the control of the changed its narrows as cannot be necessary to compillection and estimate Co.
the unavailability of department of the site and describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions. (B) Unknown. No release of observed or detected, in discounted. In the absthe foregoing data on the basthe foregoing	J. Bishop & Co. Pl. 951. The name was charged it to Christiana Metals Corports old it is now called: Bichristiana Metals old it is now called: Bichristiana Metals old is	atinum Works nged to Matth old the Plant ation on 31 M letals on 7 Ja shop Tube Co. Matthey Bis on 1 April, the above fac y of some rel it has been owledge, reco of Bishop Tube	opened the site in ey Bishop, Inc. in as Bishop Tube Co arch, 1969. Whitten arrows a property of the control of the changed its narrows as cannot be necessary to compillection and estimate Co.
the unavailability of description of Site: (Optional) In the site and describe any nearby wells. Springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions. (B) Unknown. No release of observed or detected, he discounted. In the absolute of the site conditions of current signature and Title: The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing	J. Bishop & Co. Pl. 951. The name was changed it to Christiana Metals Corports old it is now called: Bichristiana Metals old it is now called: Bichristiana Metals old is	atinum Works nged to Matth old the Plant ation on 31 M letals on 7 Ja shop Tube Co. Matthey Bis on 1 April, the above fac y of some rel it has been owledge, reco of Bishop Tub inc.	opened the site in ey Bishop, Inc. in as Bishop Tube Co arch, 1969. Whittenuary, 1974. The Division of hop changed its nar 1980. illity has been ease cannot be necessary to compillection and estimate Co. Transporter Transporter Toperator, Present Division Present Poperator, Present Transporter Toperator, Present Division Present Transporter Toperator, Present Toperator, Present Toperator, Present Toperator, Present

Senior Vice President



REFERENCE NO. 7

SEPA Notification of Hazardous Waste Site



11.

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compen- paper. Indicate the letter of the item sation, and Liability Act of 1980 and must which applies.

Form Approved OMB No. 2000-0138

EPA Form 8900-1

Please type or print in ink, if you need additional space, use separate sheets of

	be mailed by June 9, 1981.				_	_
_			81051	9	PA5-000-00	11-045
A	Person Required to Notify:		PICIL	SP TUP	E C014041	
	Enter the name and address of				E COMPAN	
	or organization required to notif	у.	Street ROUTE	30 AND	MALIN RD.	
			City FRAZE	R	State PA	Zip Code 19355
В	Site Location:		72.1	CUAR T	UBE CAMB	
	Enter the common name (if kno	wn) and	Name of Site D 1 3	SHOP I	UBE COMP	<u> HNY </u>
	actual location of the site.		StreetMA	LIN RO	DAD	
P	20,40,40,20	2				Zip Code /9355
=	1D081868309		CHY I KIIZI	/ county C/	C 3 LCV State V	219 Cate / / 3 3 3
C	Person to Contact:		Name (I set First and Title	TUAMPS	AN CHARIE	S, PROJ. ENGA
	Inter the name, title (if applicate usiness telephone number of t	ole), and he person	THE PERSON NAMED IN COLUMN	<u>" / HUM 3</u>	ON CHAREE	3, I NOJ. ENGR
	to contact regarding information		Phone 215	· 647 - :	3450	•
	submitted on this form.					
$\overline{\mathbf{p}}$	Dates of Waste Handling:					
	Enter the years that you estimat	te waste	From (Year) 195	1	1979	
	treatment, storage, or disposal bended at the site.	egan and	From (Year) [73	To (Year)	17//	
	order of the site.					
E	Waste Type: Choose the opti	ion you pro	afer to complete			
	Option I: Select general waste to you do not know the general wasencouraged to describe the site.	ste types or	sources, you are	Resource Co	nservation and Recovery	persons familiar with the y Act (RCRA) Section 300
	General Type of Waste:	Source o	d Waster	Specific Typ	a of Waste	scription of Sire.
	Place an X in the appropriate	Place an	X in the appropriate	EPA has ass	igned a four-digit numb	er to each hazardous was
	'voxes. The categories listed verlap. Check each applicable	boxes.	1 + 0	listed in the	regulations under Section in the	on 3001 of RCRA. Enter to boxes provided. A copy of
	category.		•	the list of ha	zardous wastes and cod	les can be obtained by he State in which the site
			•	located.	e EFA negion serving t	ile State ili Milicii file site
	1. 🗆 Organics	1. 🗆 Mi	_			The second section
	2. Inorganics		nstruction	<u> </u>		
	3. 🗆 Solvents	3. [] Tex		<u> </u>		
	4. Pesticides Heavy metals	4. 🗆 Fer				
	<u> </u>		per/Printing	} <u> </u>		
	6 Acids		ather Tanning			
	7. 🗆 Bases		n/Steel Foundry			
	B. C PCBs		emical, General			
	9. Mixed Municipal Waste		ting/Polishing			
	10. 🗆 Unknown		litary/Ammunition			
	11. D Other (Specify)		ctrical Conductors			
			nsformers			
			lity Companies	{		
			nitary/Refuse			
		15. 🗆 Ph		·	RECEIVED	
			o/Hospital	l R	CRA SECTION	
		17, 🗆 Un		EF	A REGION III	
			ner (Specify)	,		
		Stainless	steel pickling	May	LRRLRLRLRRRLRRRRRRRRRR	

	Notification of Hazardous Waste Site	Side Two		
F	Water quantity: Place X X in the appropriate boxes to indicate the facility types found at the site.	Facility Type 1. □ Piles	Total Facility Waste Amount	_
	In the "total facility waste amount" space give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gallons.	 2. ☐ Land Treatment 3. ☐ Landfill 4. ☐ Tanks 5. ☐ Impoundment 	Total Facility Area square feet 3555	<i> 0</i>
	In the "total facility area" space, give the estimated area size which the facilities occupy using square feet or acres.	6 ☑ Underground Injection 7. ☐ Drums, Above Ground 8. ☐ Drums, Below Ground 9. ☐ Other (Specify)	acres	
G	Known, Suspected or Likely Releases to	the Environment:		_
	Place an X in the appropriate boxes to indicat or likely releases of wastes to the environment		☐ Known ☐ Suspected ☑ Likely ☐ Nor	1 е
	Note: Items Hand I are optional. Completing hazardous waste sites. Although completing	these items will assist EPA and State the items is not required, you are en	and local governments in locating and assessing couraged to do so.	ng
H	Sketch Map of Site Location: (Optional Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a publishing map showing the site location.	" N	•	
			·	_
ı		Ownership history:	the state of the state of	
	the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions. Site consisted of 14 dm. Cesse of stainless steel. 16 columnated and closed in 19	(now called Jo 19-1974: Whittaker Corp. 174-present: Bishop Tube of 1901 receiving sanitary sewage election tank added in 19	Co., Div. of Christiana Metals Col and rimse water from acid pickl 161. Both pits were	lii
	is currently conducting a	hydrogeological ground	. of Environmental Resources, water study.	,
J	(such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A) For other persons providing	Bishop Tube Compa Sireet Route 30 and M	Pa Zip Code 19355 Dwner, Present Owner, Past Transporter Operator, Present Operator, Present Operator, Past Other	- It



REFERENCE NO. 8

E Whiteland Chester G.

PROPOSAL

Received 12/10/80

TO

ORIGINAL (Red)

BISHOP TUBE COMPANY MALIN ROAD FRAZER, PA 19355

FOR

HYDROGEOLOGIC STUDY

BCM PROPOSAL NO. 13-8326-41R

MAY 2, 1980

PREPARED BY:

(b) (4)

SENIOR GEOLOGIST

BETZ-CONVERSE-MURDOCH-INC. ONE PLYMOUTH MEETING MALL PLYMOUTH MEETING, PENNSYLVANIA 19462



ORIGINAL (Red)

INTRODUCTION

Bishop Tube Company of Frazer, Pennsylvania has been instructed by the Pennsylvania Department of Environmental Resources (PA DER) to retain a consultant to conduct a study of groundwater conditions in the vicinity of their plant site. In the past, Bishop Tube and its former owners discharged sanitary sewage, cooling water, and acid pickling rinse water to an unlined pit and cesspool located on plant property. Over the past 1-1/2 years, these discharges were diverted to a sanitary sewer, a nearby stream, and holding tanks. Consequently, the use of the pit and cesspool was discontinued.

SCOPE OF WORK

Betz-Converse-Murdoch-Inc. (BCM) proposes the following scope of work to complete the hydrogeologic study at the Frazer site:

1. <u>Initial Data Collection</u>

A BCM geologist will collect pertinent data at the site relative to past disposal practices, existing wells and core boring records. The number of required monitoring wells and their location will be established.

2. Monitoring Well Installation

BCM will subcontract with a reputable well driller to install monitoring wells at locations established in Section 1.

A BCM geologist will supervise installing the monitoring wells and will inspect and certify their construction and the nature of subsurface conditions. It is assumed that three (3) monitoring wells will be required.

Water Sampling

BCM will collect water samples from the following locations:

- Existing wells east and west wells
- Monitoring wells
- Discharge junction box and discharge outlet
- Stream Above and below discharge outlet



The samples will be analyzed for the following parameters:

Nitrate Ammonia

Zinc

Fluoride Chromium Manganese

Iron Nickel

pН

Temperature

Samples will be collected once from each sampling point. If additional sampling is required, it will be done on a per diem basis, plus expenses. These parameters and sampling locations have been designated by the PA DER Bureau of Water Quality Management staff member assigned to follow-up on this investigation.

4. Report

A draft final report will be prepared and submitted to Bishop Tube upon completion of the study. This report will include an Introduction, Methods, Results, Conclusions, and Recommendations. BCM will meet with Bishop Tube to discuss the report, and to subsequently prepare a final report suitable for submission to PA DER. A meeting with the DER is also included under this task.

5. Discharge Pipe Flow Measurement (Optional)

At the discretion of the Bishop Tube Company, BCM will measure flows in the discharge pipe between the junction box and the discharge outlet. These measurements will determine if groundwater is leaking into the pipe in that interval, thereby degrading the quality of the discharge to the stream.

QUALIFICATIONS AND EXPERIENCE

BCM has the qualifications and experience necessary to perform the full range of work required for the completion of this hydrogeologic study. BCM's staff of geologists has supervised the installation of numerous monitoring wells and has completed the hydrogeologic interpretation of subsurface conditions and groundwater flow patterns. Hydrogeologic studies completed by BCM have also included groundwater sampling and negotiations with the PA DER on behalf of our clients.

The BCM geologists assigned to this study are Robert D. Buller, Senior Geologist, and William S. Neubeck, Geologist/Hydrologist. Mr. Buller has completed over twenty hydrogeologic studies in his seven years with BCM. He will be actively involved in all aspects of the project. Mr. Neubeck has extensive experience in the supervision of well drilling and sampling and will play an integral role in similar activities for this study. BCM's experienced technicians would perform the discharge pipe flow measurements, if that option is selected. Resumes of participants are attached.

REFERENCE NO. 9



HYDROGEOLOGIC INVESTIGATION

FOR

BISHOP TUBE CORPORATION ROUTE 30 AND MALIN ROAD FRAZER, PENNSYLVANIA 19355

OCTOBER 1981

BCM PROJECT NO. 00-5265-01

PREPARED BY

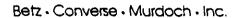
(b) (4)

GEOLOGIST

(b) (4)

ASSISTANT VICE PRESIDENT

BETZ-CONVERSE-MURDOCH-INC. ONE PLYMOUTH MEETING MALL PLYMOUTH MEETING, PENNSYLVANIA 19462





DRISTED F

CONTENTS

1.0	BACKGROUND	1
	1.1 General 1.2 Monitoring Well Installation 1.3 Monitoring Well Sampling Method]] 1
2.0	PRESENTATION OF DATA	3
3.0	DISCUSSION OF RESULTS	3
	3.1 Groundwater Quality 3.2 Surface Water Quality 3.3 Deep Groundwater Quality	6
4.0	SUMMARY OF FINDINGS	6
5.0	CONCLUSIONS AND RECOMMENDATIONS	7
	5.1 Conclusions5.2 Recommendations	7 8
APPE!	NDICES	
	Appendix 1 Well Logs Appendix 2 USGS Report on East Well	



TABLES

Table 1	Analytical Results for Samples Collected July 31, 1981	4
Table 2	Chester County Health Department Well Water Standards for Collected Parameters	5

FIGURES

Figure 1 Locations of Monitoring Wells and Closed Impoundments 2



1.0 BACKGROUND

1.1 General

The Bishop Tube Company operates a stainless steel tube manufacturing plant in Frazer, Pennsylvania. The Pennsylvania Department of Environmental Resources (DER) instructed Bishop Tube to conduct a hydrogeologic study of surface water and groundwater conditions at the plant. Betz-Converse-Murdoch-Inc. (BCM) of Plymouth Meeting, Pennsylvania, was retained to conduct the investigation, which was performed with the approval of the DER. This report describes the work performed and the results obtained, and contains recommendations for future action.

1.2 Monitoring Well Installation

Between June 3, 1981 and June 5 1981, four monitoring wells were installed on the plant site by Thomas G. Keyes, Inc. under the supervision of a BCM geologist. The well locations are shown in Figure 1; copies of the original well logs are contained in Appendix 1.

Well 1, which serves to monitor background groundwater quality conditions, is finished in the Wissahickon Schist, a lower Paleozoic metamorphic formation. Wells 2 and 4 are finished in colluvium, alluvium, or residual soils above the Conestoga Formation, an Ordovician limestone containing minor amounts of shale and phyllite. Well 2 extends into the Conestoga Formation to a depth of 24 feet. Wells 2 and 3, located on the north side of Plant Building 8, are 24 feet and 13.5 feet deep, respectively. Well 3 monitors the uppermost water-bearing zone, and Well 2 monitors a lower, apparently separate, water-bearing zone. The locations of Wells 2, 3, and 4 were selected, with the DER's agreement, to be the closest feasible downgradient sites to the deactivated and closed waste impoundments identified in Figure 1.

1.3 Monitoring Well Sampling Method

On June 16, 1981, all four monitoring wells were sampled. Because of the generally turbid conditions of the water samples, the wells were resampled on July 31, 1981. A standard procedure was followed, using a submersible pump to purge the wells and collect the samples. Also, to eliminate the uncertainties that arise from the turbid samples, all samples were filtered through an 0.45 m filter using a vacuum pump before filling the pre-fixed bottles.

All samples were transported immediately to the BCM laboratory in Norristown, Pennsylvania, where they were analyzed.

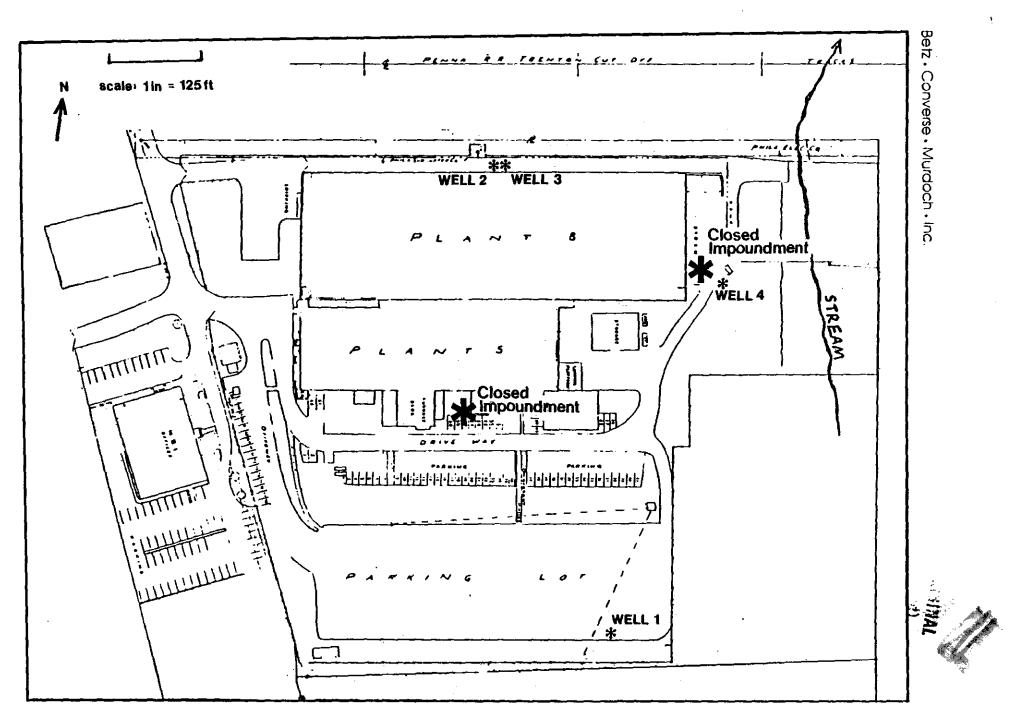


FIGURE 1. LOCATION OF MONITORING WELLS AND CLOSED IMPOUNDMENTS



On July 31, three additional monitoring points were sampled. These were all surface water stations; they were included to help ascertain the interconnection of water quality between the surface and subsurface, and to determine the effect of Bishop Tube's current discharges on the stream. The surface water stations are located as follows:

- 1. At the discharge line of the cooling water into the unnamed stream
- 2. On the unnamed stream at the upstream property line
- 3. On the unnamed stream at the downstream property line

2.0 PRESENTATION OF DATA

Table 1 presents the results of the laboratory analyses for the ground-water samples and the surface water samples. The analytical parameters listed in this table were recommended by BCM and approved by the DER. They were selected on the basis of materials used and wastewater generated at Bishop Tube.

3.0 DISCUSSION OF RESULTS

3.1 Groundwater Quality

To determine the significance of the data in Table 1, the concentrations should be compared to water quality standards. Because Pennsylvania has no state-wide groundwater standards, the convention is to use drinking water standards. The relevant standards are the Well Water Drinking Standards promulgated by the Chester County Health Department. These standards, which are essentially the same as the U.S. Public Health Service Drinking Water Standards are presented in Table 2.

A comparison of the data in Table 1 with the standards in Table 2 indicates that the values for zinc, chromium, and copper are significantly below the standards for all the wells. The nitrate levels in Wells 1 and 4 are also below the standards, but are at levels approaching the limit. The 6.77 ppm in the background Well 1 indicate that high nitrates are originating from upgradient, probably as a result of septic systems in the properties to the south. The only parameters that are above the standards are aluminum and fluoride in Well 4 and managanese and iron in Wells 2 and 4. Although no standard exists for nickel, the 0.454 parts per million (ppm) in Well 4 is higher than normal background levels.

TABLE 1

AMALYTICAL RESULTS FOR SAMPLES COLLECTED JULY 31, 1981
(A)1 values except pH in mg/1)

			:	Sampling Stat	tion		
Parameter	Well 1	We11 2	We]] 3	Well 4	Upstream	Discharge	Downstread
Total Dissolved Solids	63	303	151	353	144	205	156
Copper	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
A lumi num	<0.250	<0.250	<0.250	4.10	<0.250	<0.250	<0.250
Zinc	0.057	0.050	0.050	0.065	0.046	0.073	0.046
Chromium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Manganese	<0.014	2.22	<0.014	2.10	<0.014	<0.014	<0.014
Iron	0.054	1.01	<0.040	.173	<0.040	<0.040	<0.040
Nickel	<0.10	<0.10	<0.10	0.454	<0.10	<0.10	<0.10
Chemical Oxygen Demand	1	34	16	19	6	5	4
Nitrate - Mitrogen	6.77	<0.10	0.05	7.22	2.76	2.22	2.72
Ammonia - Nitrogen	0.02	0.16	0.10	2.1	0.02	0.12	0.07
Fluoride	<0.10	0.2	0.5	23.1	0.2	1.0	2.2
PH	6,3	7.4	8.7	6.8	7.3	7.8	7.5



TABLE 2

CHESTER COUNTY HEALTH DEPARTMENT WELL WATER STANDARDS
FOR SELECTED PARAMETERS
(All values in parts per million)

Total Dissolved Solids Copper 1.0 Aluminum Not available Zinc 5.0 Chromium (hexavalent) 0.05 Manganese 0.05 Iron 0.3 Nickel Not available Carbon Oxygen Demand Not available Nitrate 10 Ammonia Not available Fluoride 0.6 to 1.7* OH Not available	500
Aluminum Not available Zinc 5.0 Chromium (hexavalent) 0.05 Manganese 0.05 Iron 0.3 Nickel Not available Carbon Oxygen Demand Not available Nitrate 10 Ammonia Not available Fluoride 0.6 to 1.7*	
Zinc 5.0 Chromium (hexavalent) 0.05 Manganese 0.05 Iron 0.3 Nickel Not available Carbon Oxygen Demand Not available Nitrate 10 Ammonia Not available Fluoride 0.6 to 1.7*	1.0
Chromium (hexavalent) Manganese O.05 Iron Nickel Carbon Oxygen Demand Not available Nitrate Ammonia Fluoride O.05 Not available Not available O.6 to 1.7*	Not available
Manganese 0.05 Iron 0.3 Nickel Not available Carbon Oxygen Demand Not available Nitrate 10 Ammonia Not available Fluoride 0.6 to 1.7*	5.0
Iron 0.3 Nickel Not available Carbon Oxygen Demand Not available Nitrate 10 Ammonia Not available Fluoride 0.6 to 1.7*	0.05
Nickel Not available Carbon Oxygen Demand Not available Nitrate 10 Ammonia Not available Fluoride 0.6 to 1.7*	0.05
Carbon Oxygen Demand Not available 10 Ammonia Fluoride Not available 0.6 to 1.7*	0.3
Nitrate 10 Ammonia Not available Fluoride 0.6 to 1.7*	Not available
Ammonia Not available U.6 to 1.7*	Not available
Fluoride 0.6 to 1.7*	10
	Not available
oH Not available	0.6 to 1.7*
	Not available

Depends on daily air temperature



3.2 Surface Water Quality

Table 1 presents the data on the water quality samples taken from the Bishop Tube cooling water discharge and two sampling stations on the unnamed stream—one upstream and one downstream. The purpose of sampling these three points was to determine if there is a significant difference in stream water quality between the upstream and downstream points that can be attributed to the cooling water and/or groundwater discharge.

A comparison of the data from the three stations shows that only the fluoride concentration increases significantly between the upstream station and the downstream station. The 1.0 ppm of fluoride in the cooling water discharge probably is partially responsible for this increase, but it cannot completely account for the 2.2 ppm at the downstream station. Some of the fluoride contribution probably is from recharge by groundwater (that contains 23.1 ppm fluoride near Well 4).

3.3 Deep Groundwater Quality

The quality of groundwater at a depth of 300 feet below the ground surface has been determined by U.S. Geologic Survey (USGS) personnel who sampled Bishop Tube's east well on June 3, 1981 as part of a county-wide USGS study. The USGS report is contained in Appendix 2.

The USGS analyses show that all concentrations of constituents studied to be lower than the Chester County Health Department standards presented in Table 2, except for fluoride. The fluoride concentration in the well was 1.0 ppm. This level is within the range of acceptable limits, and is approximately at the recommended concentration for intentionally-fluoridated water.

It is not clear from the available data if the east well is monitoring groundwater that is potentially affected by the plant operations or if the well takes water that is upgradient from the plant. It is possible that the values shown in the USGS report are representative of regional background levels.

4.0 <u>SUMMARY OF FINDINGS</u>

 Compared to background conditions (as shown in Well 1) and drinking water standards, the groundwater beneath the site exhibits no contamination for most of the parameters.



- 2. Well 1 exhibits generally high quality water representative of background conditions. Elevated nitrate levels are the result of upgradient influences off Bishop Tube property.
- 3. Well 2 exhibits levels of iron and manganese in excess of background conditions as measured in Well 1. It appears that these levels do not represent natural background conditions.
- 4. Well 3, which monitors the shallow groundwater zone on the north side of the plant, exhibits no contamination. No contaminants are present in this well near levels of concern.
- 5. Well 4 exhibits elevated concentrations of fluoride, aluminum, manganese, iron, and nickel above background levels.
- 6. With the exception of fluoride, the surface water samples, including the cooling water discharge, showed no problems that warrant further investigation. The fluoride levels at the downstream sampling station suggest that fluoride is being added to the stream from the cooling water discharge and from groundwater discharge.
- 7. The deep groundwater beneath the site exhibits no significant contamination. The highest value is for fluoride, which, at 1.0 ppm, is within the range of acceptablility for fluoridated drinking water.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

- 1. The groundwater near Well 4 is moving towards, and discharges into, the unnamed stream. This is evident by the increase in fluoride concentration in the stream that cannot be attributed to the cooling water discharge. In recharging the stream, the fluoride-enriched groundwater becomes greatly diluted by the stream water.
- 2. The groundwater conditions at Bishop Tube are not a hazard to public health. The area of high fluoride concentrations is probably limited to the immediate vicinity around Well 4 and adjacent parts of the stream. The stream is not used for water supply and it shows significantly lower values for all parameters. The nearest public water supply well is about 1.5 miles away. Any surface or groundwater traveling from the Bishop Tube area to the public well would be diluted by several orders of magnitude before it was taken up in the well, and should be within drinking water standards.



3. It is possible that the groundwater near Well 4, which was monitored in the overburden, could move downward into the limestone. If this were to happen, any contamination in the groundwater would become very diluted before being taken up in any public water supply well.

5.2 Recommendations

Based on the conditions described previously, the surface and groundwater quality at the Bishop Tube site should be periodically monitored. This monitoring should include sampling water from the stream and from all four wells, as before. The samples should be analyzed for the key parameters shown to be important: fluoride, iron, manganese, aluminum, and nickel. This periodic monitoring will determine if changes in the system occur over time. Further action beyond this is not warranted at this time.



APPENDIX 1
WELL LOGS





WELL NUMBER:	acraround	MELL OMNEK: BIShop IN	.00.
LOCATION: upper pa	nkina lat	ADDRESS: Malvern	PA
- 1/1/15 P	J	TOTAL DEPTH: 48 FT	
		15/6	11 6-2-61
SURFACE ELEVATION:		STATIC WATER LEVEL: 15 6	DATE: 6 3 81
OR ILLER:		DRILLING METHOD: air ro	lary
company: Thomas	Keyes	DATE DRILLED: 6-3-81	START OB18
Malvern, PA	,		STOP 0915
LOGGED BY:(b) (4)	-		
		SKETCH MAP	艾 斯·哈
COMMENTS:			ger
			tin grafika Linguis
•	•		
		•	
			A SAN
~			W.
_EET		LOCATION:	
E CAMPLES			
HEAT TO COOM			September 2
HE SE SINUMBER BLOWS	DESC	RIPTION OF MATERIALS W	issahicken Schist
DEPTH FROM SAMPLES I.D. SPOON O-20 O-20 A O-20 A O-20 O-20	enothered echiet min	a, quarte publies, it brown	. 41
20'			
▎╶╟ ┈┈ ╌┠╼╌╼┩├╼┈╼╟ ╌		waited a few minutes	ne tree water.
│ ` ┥├────┤├──	it water @ approx	30 ++	
48'	total depth 48'		
-	- one soil sample	taken at 30tt -	···
	, , , , , , , , , , , , , , , , , , ,		
	20' & 4" PVC scr	een set from 48't	o 28 stavel nacked
	30' of 4" PVC cip		70 /00
	The last the	(5) (1)	·
│ ┤├── ┤ 	<u> </u>	(b) (4)	

DRILLING LOG

Bay	
ORIGINAL	5

WELL NUMBER: 2 Downgrodient	WELL OWNER: Bishap Tube
LOCATION: N side of mainplant building	ADDRESS: Malvarn. Pa.
approx. mishay and willing ~ 5' for brill	TOTAL DEPTH: 24'
SURFACE ELEVATION:	STATIC WATER LEVEL:DATE:
DRILLER:	DRILLING METHOD: air rotary, air hammer
COMPANY: Thomas Keynes	DATE DRILLED: 6/4/81
Mahren Pa	
LOGGED BY:	SKETCH MAP
COMMENTS:	SKEIGH HA
	· · · · · · · · · · · · · · · · · · ·
·	•
	LOCATION:
کے بے کیاری SAMPLES	
ESECT.D. SPOON	
	DESCRIPTION OF MATERIALS
	as, brownisa il "matrix"
(-12) Meatines itensions	indschist (P), Nety weathered limentous Freymont
water + maisture enco	untradat 8'
13-19/2) 6" Linestone, blue-grey, of	
195-24 } air Marmer Samelithology as above, r	nuchuata
Q' S 1rd Tare	10 out 10 1 0 1 11/
1 11 11 11	et from 24-15', graveD packed to 14'
ben Drute Sotran 14	-8', cuttings to 1', coment to surface
15 PVC pin set f	100 15 (5) (4) (b) (4)
Donal some of Otime	15mg 0. 1 G/st

DRILLING LOG



WELL NUMBER: 3 Dawngra Dient	WELL OWNER: Bisho Tub
LOCATION: Herde of moundant building	ADORESS: Pazin Pa
approx. 4' Fof wollto	TOTAL DEPTH: 13.5
SURFACE ELEVATION:	STATIC WATER LEVEL:DATE:
DRILLER: (b) (4)	ORILLING METHOD: Are rotary
COMPANY: Thomas Krynss	DATE DRILLED: C/4/8)
Malury Pa	DATE DRILLED: VI IV 8)
(b) (4)	•
LOGGED BY:	SK ETCH MAP
COMMENTS:	
	LOCATION:
SAMPLES	
E U U SAMPLES E U U SPOON E U U U U U U U U U U U U U U U U U U	
	SCRIPTION OF MATERIALS
10-1' Rown gravel	
	ebbles w/brown soil matrix, dry
	some school fragments waterats'
10-13 Greynatrix, platy lim	uten frynnis, marst
13-13 /2 Fresh Unweathered I in	estone bluervey dry
4" DVC screen 13	&-8', grand packed to 6'
4" DVC 0:00 8' to	surface+, bontouito 6'-1'
cement dosustrue	
	notes but probably poorly du to proplem w/pump

DRILLING LOG



WELL NUMBER: 4 Downsve Drent	WELL OWNER: Bishoolub
LOCATION: Exitat plant in Finished product	ADDRESS: Trazinta
storage son ~ 20' Not SEcomo of Shill	TOTAL DEPTH: 20'
SURFACE ELEVATION:	STATIC WATER LEVEL:DATE:
ORILLER: Teck	DRILLING METHOD: Arradzin
COMPANY: Thomas Keyner	DATE DRILLED: 8/5/81
(6) (4)	
LOGGED BY	SKETCH MAP
COMMENTS:	
· ·	
(FEE	LOCATION:
SAMPLES SAMPLES	
TE SE	RIPTION OF MATERIALS
C-4' Road grave of finer lime	intern fill
445 Morefill, encountered w	
	phyllito Flakes widhm a Feirmatrix
4" DVC screening Fro	ω 20' to 7'
4" Casing 7' to 0+	
	, bentonite do 1', cement dosnifira
Developed for ~ 40	min, on 6/5/8
	(b) (4)
1 11 11 11	



APPENDIX 2 USGS REPORT ON EAST WELL



United States Department of the Interior

ior L

GEOLOGICAL SURVEY
Water Resources Division
35 Great Valley Parkway
Great Valley Corporate Center
Malvern, PA 19355

Bishop Tube Route 30 & Malin Road Frazer, PA 19355

Attention: Mr. Chuck Thompson

Dear Mr. Thompson:

Thank you for allowing us to sample your well as part of the Chester County Ground Water Quality Monitoring Program. Enclosed is a copy of the laboratory report. Your well water meets EPA's safe drinking water standards. We may wish to sample your well again in the future as part of the program.

The quantity of dissolved substances in your well water are shown in quantities of milligrams per liter (MG/L) and micrograms per liter (UG/L). One milligram per liter of dissolved substance is equivalent to one part of the substance in one million parts of water. One microgram per liter of dissolved substance is equivalent to one part of the substance in one billion parts of water.

If you have any questions concerning the sampling procedure, please call me anytime at 647-9008. If you have any questions concerning health related problems and contaminants, please call Philip Terry, Chester County Health Department, at 431-6247.

Sincerely,

Charles R. Wood Subdistrict Chief

DKD/cdk Encl.

UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY CENTRAL LABORATORY ATLANTA, GEORGIA

CENTRAL LABORATORY ATLANTA, GEORGIA



WATER QUALITY ANALYSIS LA8-ID # 161031 RECORD-# 58682

SAMPLE LOCATION: 2432
STATION ID: 400221075321201 LAT.LONG.SEQ.: 400221 0753212 01
DATE OF COLLECTION: BEGIN--810603 END-- TIME--1100
STATE CODE: 42 COUNTY CODE: 029 PROJECT IDENTIFICATION: 444209300
DATA TYPE: 2 SOURCE: GROUND WATER GEULUGIC UNIT:
COMMENTS: UNIQUE-#:
OWNER BISHOP TUBE

ALDRIN, TOT (WATER)	UG/L	<	0.01	LEAD, DIS.	UG/L		1
ANALYZING AGENCY			80010	LINDANE, TOT (WATER)	UG/L	<	0.01
ARSENIC, DISSOLVED	UG/L		1	MANGANESE, DISSOLV.	UG/L		1
BENZENE, TOTAL	UG/L		0.0	MERCURY, DISSOLVED	UG/L		0.3
GROMOFORM, TOTAL	UG/L		. 0.0	METALS DISS CHE-EXT			0
ADMIUM, DIS.	UG/L		1,	METHOXYCHLOR T.(WAT)	UG/L	<	0.01
CARBON TETRA., TOT.	UG/L		0.0	METHYLBROMIDE, TOTAL	UG/L		0.0
CHLORDANE, T (WATER)	UG/L	<	0.1	METHYLENE CHLORIDE,T	UG/L		0.0
CHLOROBENZENE, TOTAL	UG/L		0.0	MIREX, TOT.	UG/L	<	0.01
CHLORODIBROMO., TOT.	UG/L		0.0	NICKEL, DIS.	UG/L		8
CHLOROETHANE, TOTAL	UG/L		0.0	PERTHANE, TOT.	UG/L	<	. 0.01
CHLOROFORM, TOTAL	UG/L		0.0	PH FIELD	UNITS		7.1
CHROMIUM, DISSOLVED	UG/L	•	0	PHENOLS, TOTAL	UG/L		0
CONFIRMATION ABOVE 2	UG/L		0	SP. CONDUCTANCE FLD	UMHOS		325
CYANIDE, TOTAL	DETR	₹.	DELETED	TETRACHLOROETHYLEN,T	UG/L		0.0
DDD, TOTAL (WATER)	UG/L	<	0.01	TOLUENE, TOTAL	UG/L		0.0
DDE, TOTAL (WATER)	UG/L	<	0.01	TOXAPHÈNE, T (WATER)	UG/L	<	0.1
DDT, TOTAL. (WATER)	UG/L	<	0.01	TRICHLOROETHYLENE, T	UG/L.		- ar. 0.0
DICHLORUBROMOMETHA, T	UG/L		0.0	TRICHLOROFLUOROMET, T	UG/L		0.0
DICHLORODIFLUOROME,T	UG/L		0.+0	VINYL CHLORIDE, TOTA	UG/L.	14.7	0.0
DIELDRIN, T. (WATER)	UG/L	<	0.01	WATER TEMPERATURE	DEG C		12.0
NDOSULFAN I TOTAL	UG/L	<	0.01	1,1-DICHLORETHYLEN,T	UG/L		0.0
ENDRIN, TOTAL (WATER)	UG/L	<	0.01	1,1-DICHLOROETHANE,T	UG/L		0.0
ETHYLBENZENE, TOTAL	UG/L		0.0	1,1,1-TRICHLOROETH,T	UG/L		.0.0
FLUORIDE, DISSOLVED	MG/L		1.0	1,1,2-TRICHLOROETH,T	UG/L		0.0
GROSS PCBS T (WATER)	UG/L	<	0.1	1,1,2,2-TETRCHLORO,T	UG/L		0.0
GROSS PCNS T (WATER)	UG/L	<	0.1	1,2-DICHLURGETHANE,T	UG/L		0.0
HEPT EPUX, T (WATER)	UG/L	<	0.01	1,2-DICHLURGPROPAN,T	UG/L		0.0
HEPTACHLOR T. (WATER)	UG/L	<	0.01	1,3-DICHLUROPROPAN,1	UG/L		0.0
IRON, DIS.	UG/L		10	12TRANSDICL-ETHYLENE			0.0
				2-CL-ETHYLVINYLETHER	UG/L		0.0

CONTINUED ON NEXT PAGE

UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY CENTRAL LABORATORY ATLANTA, GEORGIA



AS N MG/L

0.02

WATER QUALITY ANALYSIS LAB-ID # 162811 RECORD-# 58928

SAMPLE LOCATION: 2432 STATION ID: 400221075321201 LAT.LONG.SEQ.: 400221 0753212 01 DATE OF COLLECTION: BEGIN--810603 END--TIME--1100 STATE CODE: 42 COUNTY CODE: 029 PROJECT IDENTIFICATION: 444240300 DATA TYPE: 2 SOURCE: GROUND WATER GEULOGIC UNIT: COMMENTS: UNIQUE-#1 OWNER BISHOP TUBE

80010

ANALYZING AGENCY

_	CARBON, ORGANIC, NITR DIS NO2 AS TR DIS NO2+NO3	N MG/L	0.9 0.01 0.14	NITR. DIS NH4 AS I PH FIELD SP. CONDUCTANCE FI WATER TEMPERATURE	UNITS LD UMHOS	0.03 7.1 325 12.0
	ı	CATIONS		Al	NIONS	
		(MG/L)	(MEQ/L)	NITR DIS NO2+N	(MG/L) 0.14	(MEQ/L) 0.010
		TOTA	1L		TOTAL	0.010

NITR DISS NH4



THE FROM LEWIS . 10

YOTE: SEE COPY 2 EFFORE SIGNING	Spri	n. Gl			WAS	AU OF	WAT CHA	ER QUA	ALITY SPEC	MANA	GEMEN REPO	NT (TIME 8-		
STABLISHMENT	711	ASE	1994			LOC	LOCATION (STREET/STATE ROUTE) COUNT								IICIPALITY	PROGR	M		
Bushep lube	<u>_(jc</u>	, ,	7 9 % 2 ¹ 2	ALIDO	RTIFICAT	<u> </u>	Malin Ka					PHONE		POP		White TACRES UNDER	/W	ALREADY	
) ^{PE} (b) (4)			1	YES		NO			٠,			, , ,			SER	VED	PERMIT	MINED	
RESPO(b) (4)			4	DORESS	h.	0.		1	7	7			PHONE						
ERSC				1.30	Meles)Kd	<u>~</u>	<u>10581</u>	1.	d			734			<u>/i</u>	NDUSTRIAL PR	ODUCTS	
EHSC				ADDRESS J TELEPHONE											Sec	amle.	u Julies		{
TREATMENT PROCESS	NUM	BER OF UNI	IS							RKS					VIOLATIONS				
	TO		-1544	is tie	d.up	_w/	- / /	<i>ill</i>	X4 1	1.1566.	يلرب	dail	DH CA	7 4 Tr	<u> nabli</u>				
to accomp		es our	1 00	Mil	encer	1,7	$\frac{\nu}{\pi}$	<i>k</i> ,	1	44 4 4	1000	21 4 /	1.17	4 10	ILLE HIL	,			
											10	/	/						
		,					 -		6/						7 7-			<u> </u>	
Spung	acido	Large	area	<i>ou</i> s	DOLL	LUEN	<i>F</i> .>	<u>uu.</u>	7	<u>yu op</u>	urc	/ KU	as_	LAKIKE	dute				
attention		West	eone	aus 9	to be	au	1	\mathcal{A}_{-}	م	Dest	ble	. //	The	. Hest	ace.				
			,,,					7		/		/		7 4	,,	- 1. 4.00	DECLI ATIONS O	D OCDIACT AIC	9 0040
- of water	JUNE	te , ti	wy gsa	<u> </u>	-uc,	MU	<u> </u>	je,	<u> Lli1</u>	(Asea	<u> </u>	<u>odo</u>	4 : 	<u> </u>	grs 1/	LAW	S, REGULATIONS O	K PERMIT NU	, & CONU.
spellase	w	this	aua	a	ls0 11	Lesee		while	\mathcal{L}	Aces	1	Te.	MILIT	red	·				
7,0	1		<i>-</i>	-1-1		<u></u>				/` - ***		/				1_			
55-83 11:10 -Char	0150	AHUNI NGO OL	CO - C	ALR Ll + 1	elise.	lary	K	المنا		aked	md	111 P.		JA I Pad	La cilla	Aau	udebus		
SAMPLING POINT	W	8W QUALI	TY	CHLOR	COLOR	OD		TE		0.0	Π.	SPEC		. DAILY		CEIVI	NG STREAM A	PEARANG	E
	RE	PORT NUM	BER P	RES	COLON	100		 			- 10	COND.		N (MGD		N/	AME	ABOVE	BELOW
- Upfluert			5 125			<u> </u>		2/	<u>°C</u>		_		01	28	100	/ 1/	11. 0 1	DIS APP	DIS APP
Spring			6	<u> </u>		<u> </u>							<u> </u>			र ति	lley (resk		
Lette Dew @30		10	7 1.2	1		l		10	<u>'C</u>			1904	1.						
			-			1		1			-	1-7			1		····	OR	
IDENTIFICA	TION		FAC	- <u></u>	AC	FAC		FAC		D/	ATE C	, F	INSP	ECTING	L			GII.	<u>l </u>
C CO MUN T	EST	CASE	NO. 1		0. 2	NO. 3	, <i> </i>	NO. 4			PECTI			ENCY				AL	
A 4.5 6.8 9	10-11	12-13	14-16		4-16	14-16	- .	14-16			17-22	1ठ छ	,, -	3-25					
· ×		الباب					_] [[05	04	18 17	142	CAL	PERSON	7. 557	IEWED ISTONATI	JAE)	11
<u> </u>	ACH IT	Y NAME				DIC	voi	/saco		COMPL	LIANC	E	PERMIT	OPER	TITLE AN	IDDATE	KI WEGIN	CKINI	110
(-)	ACILI)	MAINE				l nis	VOL	. (MGD	FEC	TAI	FAC	OP	COMP	STAT	1		' da	K-20	- 1
							49.	52	66	67	68	69	70	71-72	(b) (4)				
0 00	210	/2									1	1	1	76					1
H	·	· · · · · · · · · · · · · · · · · · ·							╁		 -	۱		 - 	1				
																. Leaf			
JOH BLACK INK ONLY)							CENT	RAL C	FFICE										

	Fixed Samples
ER-SL13 REV. 1-82	
	
	metal.
	The second secon
ESTABLISHMENT Coat	so libe Co

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES BUREAU OF LABORATORIES

WATER OR WASTE QUALITY REPORT



		ALL CHE MG/L	IMICAL ANALYSES EXPRESSED IN INLESS OTHERWISE SPECIFIED	neroni Da	e Received (1750)	
ESTABLISHMENT 2	be. G	CASE		FACILITY		COLL NUMBER
COUNTY	MUNICIPALITY	PROGRAI	M COLENAME		TYPE TR	STO ANALYSIS
CARD (3) ID C	ODE (ALL CARDS) 4-16		TUDE 4-10 LONGITI	UDE 11-18 DATE 19-2		
					813 18 1	10 2
USGS-Q 30-34	BUREAU 35-37 AMIS S	AMPLE NUMBER 38-43		FLUEINT I	RE	LATIVE POINT 58
TRIBUTARY TO: FULL DESCRIPTION WHERE SAMPL	E TAKEN AT . L	a)			ADDITIONAL	LAB ANALYSES
	00.0			`		
		I lx	THOS			
FIELD ANAL		3		LAB ANALYSES	/	<i>*</i>
	L	Chemiet		Oete Analyzed Total Solida	(00600)	
Source of Sample	61-62	Color	(00080)			
Remon Sempled	63-04	Turb	(00070)	Susp. Solids	(00630)	
	oportional hitorm 65		(00403)	Set Solids	(00545)	
Te	imporal 66 letial	Spec. Cond	(00095)	Total Disa Solids	(00515)	
Aliquo	ta 67-68		(00410)	MON	(00615)	
	firmated es	pH4	(00436)	no,n	(00620)	
Condition Above - 1 Normal Below - 3 No Flor	w-4 ⁶⁰ [OMS	(70808)	NH ₂ N	(00610)	
Stream Flow-CFS (00061)		Core	(00435) (00660)	KION	(00625)	
Strw-MGD (50051)		=	(00340)	_ <u></u>	<u> </u>	
Pipe Flow-MGD (50050)				Hardness	(00000)	
Gage Reading-Ft. (00066)			(00310)		(00916)	
Temp (C) (00010)		P 70	(00000)	M ₉	(000271	
pH (00400)		Al-Tot ug/I	(01105)	Sa	(00945)	
D.O. (00300)		Cd-Tot ug/I	(01027)		(00940)	
Ct (50060)	<u> </u>	Cr-Tot ug/1	(01034)	++1,/	(00951)	
Hal Br (71871)					<u> </u>	
1 (71886)		\	(01042)	MBAS Dr	(38260)	
Spec Cond (00094)		Fe-Tot ug/1	(01045)	1 1 11 1	(32730)	
Appearance (46001)		Mn-Tot ug/t	(01055)	Cyanide	(00720)	
Odor (01330)		—'ll i	(01067)			
. ,	Log 5/4	Pb-Tot ug/ I	(01051)	'_)	
Legal Seal No	OBICIA	Zn-Tot ug/t	(01052)	(_	,	
Condition of Seat				3		



WATER AND WASTEWATER REPORT SAMPLE NUMBER - 8315406

COLLECTOR - N. SHUP WON1

COLLECTOR NO - 0117105

ESTAB - BISHOP TUBE CO

CASE NAME - FACILITY -

ID CODE - NONE

WON STATION NUMBER - 000

SAMPLING DATE - 5/04/83 TIME - 8:10 LAT - 00:00:00.0 LONG - 00:00:00.0

TYPE - 03 SOURCE - 08 STD ANAL - 500 RECEIVED ON - 5/05/83
REPORT REVIEWED BY _____ DATE - 5/16/83

STORET DESCRIPTION RESULT CONC VERIFY BY VERIFY DATE COMM CODE LABORATORY ANALYSIS : 00095 SPEC COND 301.0000 REW 5/06/83 00310 BOD 5 DAY ALS 5/12/83 0.4000 XG/L G 20403 PH LAB LCC 7.8000 6 5/10/83 00410 T ALK CACO3 70.0000 NG/L LCC 5/10/83 00530 RES TOT NONE HMJ 2,0000 HG/L 5/06/83 00610 T NH3-N 0.0900 MG/L ICB 5/05/83 00615 T NO2-N HG/L ICB 0.0240 G 5/06/83 00620 H-EOK T 2,4200 H6/L G ICB 5/06/83 03665 PHOS-T HG/L 0.2400 HG/L 6 LB\$ 5/11/83 00940 CHLORIDE 22.0000 NG/L ICB 5/05/83 00945 SO4 TOT 36.0000 MG/L LBS 5/09/83 6 00951 0.5000 ICB F. TOTAL MG/L G 5/10/83 01027 CD TOT UG/L 0.2000 UG/L 6 BHL 5/06/83 01034 CR TOT UG/L , 10.0000 UG/L MRO \$/11/83 01042 CU TOT UG/L 20.0000 UG/L HRO 5/11/83 01045 FE TOT 70.0000 UG/L G MRO 5/11/83 01051 PB. TOTAL 5.0000 UG/L BHL G 5/06/83 01055 HN TOTAL 40.0000 UG/L NRO 5/11/83 11.967 NI. TOTAL 20,9000 UG/L MRO 5/11/83 J1092 ZH. TOT UG/L 60.0000 UG/L ORK 5/11/83 01105 AL, TOTAL 270,0000 UG/L HRO 5/10/83

SAMPLE COMMENTS

4. :

NO SAMPLE COMMENTS

TOTAL NUMBER TEST FOR THIS SAMPLE 21

OKICINAL (keq)

Fixed Samples	- COMMONWEAU	TH OF PENNSYLVANIA		Magon	,
HEV. 1-32	DEPARTMENT OF EN	VIRONMENTAL RESOURCES F LABORATORIES	LAS. Numbe	THE HAVE OF	
O melals		TE QUALITY REPORT	Date Receive	6, 358°	<u> </u>
	ALL CHEMICAL A - MG/L UNLESS (NALYSES EXPRESSED IN OTHERWISE SPECIFIED	14	ea) A	
ESTABLISHMENT	CASE	FACILITY		COLL NU	MBEA /
COUNTY Whe (D)	PROGRAM	COLL NAME		TYPE TR STD ANA	LYSIS
Chester Ewh	ite lus	m Jul		<u>0 </u>	20
CARD (3) ID CODE (ALL CARDS) 4-			DATE 19-24	TIME 25-26 :	KIND 25
2		101110	15/04/813	18 3P	31
USGS-Q 30-34 BUREAU 35-37 AMIS	SAMPLE NUMBER 38-43	STREAMNAME 44-57	11111	RELATIVEPO	
TRIBUTARY TO:		OFFICIAL		ADDITIONAL LAB AN	ALYSE:
FULL DESCRIPTION WHERE SAMPLE TAKEN	ence on n. Sid	e probenty		~ \$ €	
		<u> </u>		7, TA 9	
FIELD ANALYSES	2 004/20	LAB ANALYS			
Typr ^*raple Se-80	17	•		/=/	
	Chemist	Date:	Analyzed		_
Source of Sample 61-62	4 Caler (00000)	Total	Solids (00600)		
Respon Sampled 63-64	Turb (00070)	Sung	. Solids (00530)		
Proportional Composite Uniform 6	5 (00403)	Set	30lids (00 646)		T
Sample Temporal &		Tota	Diss Solids (00\$15)		
Spetial .	Spec. Cons (00096)				
Aliquota 67-88	(00410)		(00815)		
Flaw Estimated. Misseured	pH4 (00436)	NO,	(00820)		
Condition Above - 1 Normal - 2 Flood - 5 Below - 3 No Flow - 4	pH8 1/0008)	NH-	(00610)		
	Cate (00435)	Kget	N (00425)		
Stream Flow-CFS (00081)	T.O.C. (00680)				
Sire. Jw-MGD (50051)	C.O.D. (000940)	Hard	ness (00900)		T
Pipe Flow-MGO (50050)	3-Day 800 (00310)				
Gage Reeding-Ft. (00085)	T (00066)	°	(00016)		
Temp (C) (00010)	Р то (00000)	Mg Mg	(00027)		
pH (00406)	Al-Tot ug/1 (01105)	80.	(00845)		
D.O. (00300)	Cd-Tot ug/1 (01027)	CI	(00940)		
Ct (50060)	 		}		
Hai 8r (71871)	Cr-Tot ug/1 (01034)		(00051)		
1 (71886)	Cu-Tot ug/t (01042)	MBA	S (38260)		
Spec Cand (00094)	Fe-Tot ug/t (01045)	Phen	Ois Dr. (48002) g/1 Ds (32730)		• [
Appearance (48001)	Mn-Tot ug/1 (01055)	Cyar	لـــا		
Occi (01330)	NI-Tot ug/((01067)		(·)		
CUSTODY LOG How Shipped (nat)	Pb-Tot ug/1 (01051)		()		

(01092)

<u>ORIGINAL</u>

Legal Seal No. ..

Received by ______
Condition of Seal_



WATER AND WASTEWATER REPORT SAMPLE NUMBER - 8315407

COLLECTOR - N. SHUP WGHI

COLLECTOR NO - 0117106

ESTAB - BISHOP TUBE CO

CASE NAME -FACILITY -

ID CODE - NONE

WON STATION NUMBER - 000

SAMPLING DATE - 5/04/83 TIME - 8:30 LAT - 00:00:00.0 LONG - 00:00:00.0

TYPE - 07 SOURCE - 04 STD ANAL - 500 RECEIVED ON - 5/05/83
REPORT REVIEWED BY DATE - 5/16/83

Her off, Newson	(b) (4)						
DESCRIPTION		RESULT	CONC	VERIFY	BY	VERIFY DATE	COMM CODE
RY ANALYSIS :							
SPEC COND		447.0000		6	REV	5/06/83	
BOD 5 DAY		1,0000	HG/L	G	RLS	5/12/83	
PH LAB		7.8000		6	LCC	5/10/83	
T ALK CACO3		174.0000	M6/L	6	LCC	5/10/83	
T NH3-N		0.0400	MG/L	6	ICB	5/05/83	
T NO2 -N		0.1300	MG/L	G	ICB	5/06/83	
T NO3-N		0.4700	HG/L	G	ICB	5/96/83	
PHOS-T HG/L		0.2600	HG/L	G	LBS	5/11/83	
CHLORIDE		29.0000	HG/L	6	ICB	5/05/83	
SO4 TOT		22.0000	HG/L	6	LBS	5/09/83	
F, TOTAL		0.2400	H6/L	6	ICB	5/10/83	
CD TOT UG/L		0.2100	UG/L	6	BHŁ	5/11/83	
CR TOT UB/L		60.0000	UG/L	6	HRO	5/11/83	
CU TOT UG/L		40.0000	UG/L	6	KRO	5/11/83	
FE TOT		2930.0000	UG/L	6	MRO	5/11/83	
PB, TOTAL		12.8000	UG/L	G	ᄣ	5/06/83	
NN TOTAL		560.0000	UG/L	6	HRO	5/11/83	
NI, TOTAL	< −	10.0000	UG/L	6	HRO	5/11/83	
ZN. TOT UG/L		60.0000	UG/L	8	HRO	5/11/83	
AL, TOTAL		170.0000	UG/L	6	HRO	5/10/83	
	DESCRIPTION IRY ANALYSIS: SPEC COND BOD 5 DAY PH LAB T ALK CACO3 T NH3-N T NO2-N T NO3-N PHOS-T HG/L CHLORIDE SON TOT F,TOTAL CD TOT UG/L CR TOT UG/L CR TOT UG/L HN TOTAL NI,TOTAL ZN,TOT UG/L ZN,TOT UG/L	DESCRIPTION IRY ANALYSIS: SPEC COND BOD 5 DAY PH LAB T ALK CACO3 T NH3-N T NO2-N T NO2-N T NO3-N PHOS-T HS/L CHLORIDE SO4 TOT F,TOTAL CD TOT UG/L CR TOY UB/L CU TOT UG/L FE TOT PB,TOTAL NI,TOTAL ZN,TOT UG/L	DESCRIPTION RESULT RY ANALYSIS: SPEC COND 447.0000 BOD 5 DAY 1.0000 PH LAB 7.8000 T ALK CACO3 174.0000 T NH3-N 0.0400 T NG2-N 0.1300 T NG3-N 0.4700 PHOS-T MG/L 0.2600 CHLORIDE 29.0000 F,TOTAL 0.2400 CD TOT UG/L 0.2100 CR TOT UG/L 40.0000 PB,TOTAL 40.0000 PB,TOTAL 12.8000 NI,TOTAL 560.0000 NI,TOTAL 60.0000 ZN,TOT UG/L 60.0000	DESCRIPTION RESULT CONC IRY ANALYSIS: SPEC COND BOD 5 DAY 1.0000 HG/L PH LAB 7.8000 T ALK CACO3 174.0000 HG/L T NH3-N 0.0400 HG/L T NO2-N 0.1300 HG/L T NO3-N 0.4700 HG/L CHLORIDE 29.0000 HG/L CHLORIDE 29.0000 HG/L CHLORIDE 29.0000 HG/L CD TOT UG/L 0.2100 UG/L CR TOT UG/L 0.2100 UG/L CR TOT UG/L 40.0000 UG/L PB.TOTAL 12.8000 UG/L NI.TOTAL 10.0000 UG/L XI.TOTAL 10.0000 UG/L	DESCRIPTION RESULT CONC VERIFY RY ANALYSIS: SPEC COND 447.0000 6 BOD 5 DAY 1.0000 MB/L G PH LAB 7.8000 6 T ALK CACO3 174.0000 MB/L G T NH3-N 0.0400 MB/L G T NO2-N 0.1300 MB/L G T NO3-N 0.4700 MB/L G T NO3-N 0.4700 MB/L G CHLORIDE 29.0000 MB/L G SON TOT 22.0000 MB/L G F,TOTAL 0.2400 MB/L G CD TOT UG/L 0.2100 UG/L G CT TOT UB/L 60.0000 UG/L G PB,TOTAL 12.8000 UG/L G PB,TOTAL 560.0000 UG/L G NI,TOTAL 560.0000 UG/L G ZN,TOT UG/L 60.0000 UG/L G RI,TOTAL 560.0000 UG/L G	DESCRIPTION RESULT CONC VERIFY BY RY ANALYSIS: SPEC COND 447.0000 6 REW BOD 5 DAY 1.0000 MG/L G RLS PH LAB 7.8000 6 LCC T ALK CACO3 174.0000 MG/L G LCC T NH3-N 0.0400 MG/L G LCB T NO2-N 0.1300 MG/L G LCB T NO3-N 0.4700 MG/L G LCB T NO3-N 0.4700 MG/L G LCB CHLORIDE 29.0000 MG/L G LCB SON TOT 22.0000 MG/L G LCB F,TOTAL 0.2400 MG/L G LCB CD TOT UG/L 0.2100 UG/L G BHL CR TOT UG/L 40.0000 UG/L G MRO PB,TOTAL 12.8000 UG/L G MRO PB,TOTAL 560.0000 UG/L G MRO PB,TOTAL 560.0000 UG/L G MRO PB,TOTAL 560.0000 UG/L G MRO NI,TOTAL 560.0000 UG/L G MRO	DESCRIPTION RESULT CONC VERIFY BY VERIFY DATE RY ANALYSIS: SPEC COND 447.0000 G REW 5/06/83 BOD 5 DAY 1.0000 HG/L G RLS 5/12/83 PH LAB 7.8000 G LCC 5/10/83 T ALK CACO3 174.0000 HG/L G LCC 5/10/83 T NH3-N 0.0400 HG/L G LCB 5/05/83 T NO2-N 0.1300 HG/L G LCB 5/06/83 T NO3-N 0.4700 HG/L G LCB 5/06/83 T NO3-N 0.4700 HG/L G LCB 5/06/83 PHOS-T HG/L 0.2600 HG/L G LCB 5/06/83 SON TOT 22.0000 HG/L G LCB 5/05/83 SON TOT 22.0000 HG/L G LCB 5/05/83 CD TOT UG/L 0.2100 UG/L G LCB 5/10/83 CD TOT UG/L 0.2100 UG/L G BHL 5/11/83 CC TOT UG/L 40.0000 UG/L G HRO 5/11/83 CU TOT UG/L 40.0000 UG/L G HRO 5/11/83 PB,TOTAL 12.8000 UG/L G HRO 5/11/83 NI,TOTAL 560.0000 UG/L G HRO 5/11/83 ZN,TOT UG/L 60.0000 UG/L G HRO 5/11/83 ZN,TOT UG/L 60.0000 UG/L G HRO 5/11/83

SAMPLE COMMENTS NO SAMPLE COMMENTS

TOTAL NUMBER TEST FOR THIS SAMPLE 20

(Ked) Original

	EH-8L13 REV. 1-82							c	OMMONWE	ALTH O	F PENNSY	LYANIA						- (N.		_
			*					DEPART	iment of 8	ORIVA	NMENTAL SORATOR	RESOUR	PCES			LAS. Numb	** -	<u></u>	67			-
٠.		Dred.	2.20			. 1	NATE	ALL	R WAS	ANALY	SES EXPE	E\$\$&0 :		ORT		Date Recei	ved T	RIGI	177			<u></u> -
	ESTABLISHMEN	(T /	, ,	_		CASE				<u>.</u>			FACILI	ΙΤΥ		<u> </u>				الإجاد		=
	1000 Mich	7) Ú.		<u></u>				<u> </u>					<u> </u>	•						10	<u> </u>	
	COUNTY	د. عاد	MUI	NICIPALI'	The Sheet	<i>t</i> .			MARE	COLL	NAME,	ار د)				TYPE		ST	57	ALYSI DO	S
	CARD (3)		ID CODE (AL					_	ATITUDE 4	-10	1		TUDE 11	-18	1	19-24		TIME			KIN) 29
	1 2	Cnty	Mun T	Est	Case	'	Fac	, [1 1	O	,]	,	1 1	0150	1 213	71		51	٥	6	,
	USGS-Q 30-34		المسا	35-37 A	. 1	المأ	LENUMS	ER 30-	13	<u> </u>		1 a .	MNAME	44-57		<u> </u>				TIVEP	OINT	58
	TRIBUTARY T	ro:		0.1	/ >	0		**	_/1	/ 4	4/	21	<u> [] </u>	14	E V	4 4 4	ADDI		AL L	A AN	IALY:	SES
	FULL DESCRIPT	TION WHERE	sample take	N A	۷, کا	de	. R	30)													_
															 _						<u> </u>	
						_			22	60	FIRS											
	Time Grants	PIELD	ANALYSES	59-40		5	۵.							B AN	ALYSES				/	i	/	
	Type Sample			37-60	<u> </u>	<u> </u>	Chemist .								Date Analyzed		7		<u> </u>	=		
	Sc Sampl	le .		61-62		4	Color		(00080	, [Total Solids	(00500	"		<u>] </u>	Щ	-	
	Resson Sampled	.		63-64		7	Turb		(00070	, 「		$\overline{}$			Susp. Salids) (00530	, [
	Composite		Propertion Uniform	ei	65		(PH)		(00403	,	11	Ť			Set Solids	(00645	, <u> </u>	T	Ī			
	Sample		Temporal		es [-			Total Disa So	lida (00515	, <u> </u>	T				一
	-		Spatial			_	Spec. Co	ond	(00095	' <u>L</u>						(0001)	<u> </u>	<u> </u>	<u> </u>	닐		=
	·		Aliquote	67-68			(AIR)		(00410	, _					NON	(00615	" <u> </u>		<u> </u>			
	Flow	•	Estimated Measured		₩[1	pH4	′.	1 (00436	, [1				NO,N	(00620	" [
			Normal - 2 No Flow - 4	Flood - S	80		PH8	lot 🗌	(70508			T			ин,и	(00610	,	=				<u></u> -
	Stream Flow-CF5	S (00061)			CAR	D (2)	Co T.O.C.	NG	(00435			一		\exists	Kjel-N	(00625	,	Ī	Γ			
	Sire* "lov-MG			+-		=				<u> </u>	<u> </u>											
	Pipe riuw-MGD	(50050)				-	C.O.D.	\	(00340	' <u>上</u>		<u> </u> _	<u> </u>		Hardness	(00900)	9					
	Gage Resding-Fl	t. (00065)		+		={\	5-Oay B		(00310	<u> </u>	1				Ca	(00916	, 🗀			\Box		
		(2000)				╡		<u>.</u>	(00665				·					<u> </u>				_
	Temp (C)	(00010)				ᆜ										(00927	ـــا '	<u> </u>	<u> </u>	<u></u>		
	рH	(00400)				_	Al-Tot u	9/1	(01105)	· L					sa.	(00945	, [<u> </u>				
	D.O	(00300)					Cd-Tat u	19/1	{01027						CI/	(00940	· [
	ا ا	1 (50000)		 -1	· · · · · · · · · · · · · · · · · · ·		Cr-Tat u	ועם [(01034)		11	\neg			<i>,</i> /	(00951					_	
	Hai B	r (71873)				∦			104040				1 1		MBAS			 				_
		(71886)			.	_,	Cu-Tot s	19/1	(01042)	z				_	Phenois	(38260 Dr. (46002	L	<u> </u>			<u></u>	
	Spec Cond	(00094)			1		Fe-Tot u	أنو	(01045)			\perp			ug/i	Ds (32730)	1	<u> </u>				_
	Appearance	(46001)					Mn-Tot o	ug/1 }	(01055)						Cyanide							
	Oder	(01330)					Ni-Ton u	9/1	(01087)	, [T		T		 	·———						
		CUST	ODY LOG		9/4	\neg	_ ·	1					7 7									_
	How Shipped		(pay)	Da	itė 🔼	-{	Pb-Tol u	י ועם	(01051)		1_1		1				ـــا '	<u> </u>				
	Legal Seal N Received by		TURBIT	· O		-	Zn-Tot u	g/1	(01092)	Г					 (l						

Received by ______Condition of Seal.



WATER AND WASTEWATER REPORT SAMPLE NUMBER - 8315408

COLLECTOR - N. SHUP WON1

COLLECTOR NO - 0117107

ESTAB - BISHOP TUBE CO

CASE NAHE -

FACILITY -

ID CODE - NONE WON STATION NUMBER - 000

SAMPLING DATE - 5/04/83 TIME - 10:50 LAT - 00:00:00.0 LONG - 00:00:00.0

TYPE - 05 SOURCE - 01 STD ANAL - 500 RECEIVED ON - 5/05/83

REPORT REVIEWED BY DATE - 5/16/83

|--|

		,			_			
DESCRIPTION		RESULT	CONC	VERIFY	BY	VERIFY DATE	CONM	CODE
Y ANALYSIS :								
BOD 5 DAY	<	0.2000	H8/L	6	RLS	5/12/83		
PH LAB		7.6000		6	LCC	\$/10/83		
T ALK CACO3		38.0000	X6/L	6	LCC	5/10/83		
RES TOT NONE		2.0000	MG/L	G	ЩU	5/04/83	•	
T NH3 -N		0.0100	HG/L	6	ICB	5/05/83		
T NO2-N		0.0240	X6/L	G	ICB	\$/06/83		
N-EON T		2.8600	HG/L	G	ICB	5/06/83		
PHOS-T MG/L		0.0400	XG/L	G	LIBS	5/11/83		
CHLORIDE		25.0000	KG/L	G	ICB	5/05/83		
SON TOT		24.0000	HG/L	6	LBS	5/09/83		
F,TOTAL		0.8600	HG/L	G	ICB	5/10/83		
CD TOT UG/L	<	0.2000	UG/L	G	BHL	5/11/83		
CR TOT UG/L	<	10.0000	UG/L	G	HRO	5/11/83		
CU TOT UG/L		10.0000	UG/L	G	KRO	5/11/83		
FE TOT		110.0000	UG/L	6	MRO	5/11/83		
PB. TOTAL	<	5.0000	UG/L	G	BHL	5/06/83		
NN TOTAL		50.0000	UG/L	6	HRO	5/11/83		
NI,TOTAL	<	10.0000	UG/L	G	HRO	5/11/83		
ZH, TOT U6/L		19,0000	UG/L	6	MRO	5/11/83		
AL, TOTAL		190.0000	UG/L	G	HRO	5/10/83		
	Y ANALYSIS: BOD 5 DAY PH LAB T ALK CACO3 RES TOT MONF I M13-M I M02-M I M03-M PHOS-T MG/L CHLORIDE SON TOT F, TOTAL CD TOT UG/L CR TOT UG/L CR TOT UG/L CR TOT UG/L HN TOTAL HN TOTAL NI, TOTAL ZN, TOT UG/L	PH LAB T ALK CACO3 RES TOT MONF T MH3-H T MO2-H T MO3-H PHOS-T MG/L CHORIDE SO4 TOT F,TOTAL CD TOT UG/L CU TOT UG/L CU TOT UG/L FE TOT PB,TOTAL NI,TOTAL ZN,TOT UG/L	Y ANALYSIS : BOD 5 DAY	Y ANALYSIS : BOD 5 DAY	BOD 5 DAY	MALYSIS : BOD 5 DAY	BOD 5 DAY	BOD 5 DAY

SAMPLE CONNENTS

NO SAMPLE COMMENTS

TOTAL NUMBER TEST FOR THIS SAMPLE

(Keq) ORIGINAL

F (Aet. Samples		.35804 %
ER-01:13 REV. 1-82	COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES BUREAU OF LABORATORIES	LAB. Number
	WATER OR WASTE QUALITY REPORT ALL CHEMICAL ANALYSES EXPRESSED IN MG/L UNLESS OTHERWISE SPECIFIED	Pro
ESTABLISHMENT CA	SE FACILITY	COLL NUMBER
Burron Sulse Co		371
COUNTY	PROGRAM COLL NAME	TYPE TR STO ANALYSIS
CARD (3) ID CODE (ALL CARDS) 4-18	LATITUDE 410 LONGITUDE 11-15	0 500 DATE 19-24 TIME 25-28 KIND 29
CARO (3) ID CODE (ALL CARDS) 4-16 Conty Mun T Est Case	Fee DANIES TO DE TOUR	120982 18010 2
▕▐ ▔▃▃──────────────────────── ──────────	PLE NUMBER 38-43 STREAM NAME 44-57	RS INVEPOINTS
TRIBUTARY TO:	11 1 7 3 7 1 EIFIFLU	ADDITIONAL LAB ANALYSES
FULL DESCRIPTION WHERE SAMPLE TAKEN		
		C E C
		BE 13 1683
FIELD ANALYSES	LAB AN	ALYSES IN IN SALES
Type Sample 59-60 3	Chemist	Source CE
Sor. Ji Sample 61-62		Total Solide Watersoft Last REGISTA
	Color (00040)	Total Solide With RESIDENT OF NORRESTONN
Resson Sampled 53-64 /	Turb (00070)	(Susp. Solids) (00630)
Composite Uniform 66 Sample	(M) (00403)	Set Solids (00649)
Temporal de Spaties	Spec. Comd (00095)	Total Disa Solide (00515)
Airquota 67-68	Alls (90410)	NO ₂ N (00615)
Flow Estimated 69	pH4 (00436)	NO ₂ N (00820)
Condition Above - 1 Normal - 2 Flood - 5 80 80	PHS Hot (70606)	NH,N (00810)
CAÑO (2	Cold (00438)	Kjel-N (00625)
Stream Flow-CFS (90081)	T.O.C. (00480)	(0000)
Sb: 76-MGD (50081) Pipe Flow-MGD (50080)	C.O.D. (00340)	Hardness (00900)
Gage Reeding-Ft (00065)	5-Day 8OD (90310)	Ca. (00916)
	T (00668)	(100/10)
Temp (C) (00010)		Mg (00827)
рм (00400)	Al-Tol ug/1 (01106)	SO ₄ (00945)
D O. (00300)	Cd-Tot ug/1 (01027)	(C) (00940)
C1 (5006C)	Cr-Tot ug/ i (01034)	F) (00851)
Hai Br (71871)	Cu-Tot ug/1 (01042)	MBAS (38280)
J (71886)		Phenois Or. (48002)
Spec Cond (00094)	Fe-Tot ug/1 (01045)	ug/1 Ds (32730)
Appearance (46001)	Mn-Tot ug/1 (01055)	Cyanide (00720)
Odor (01330)	NI-Tot ug/1 (01067)	
How Shipped Lucid Date	Pb-Tot ug/ (01051)	
Legal Seal-Na.		
Condition of Stell	Zn-Tot ug/1 (01092)	(8)
CONDUIDOR OL 2886	_	<u></u>

CRICINIAL



WATER AND WASTEWATER REPORT SAMPLE NUMBER - 8235804

COLLECTOR - M. SHUP WOHL

COLLECTOR NO - 0117371

ESTAB - BISHOP TRIBE CO

CASE NAME -

FACILITY -

ID CODE - NONE

WON STATION NUMBER - 000

SAMPLING DATE - 12/09/82 TIME - 8:00 LAT - GO:00:00.0 LONG - 00:00:00.0 TYPE - 03 SQURCE - 08 STD ANAL - 500 RECEIVED ON - 12/10/82 SEAL NO(S)

REPORT REVIEWED BY (b) (4)(b) (4)(b) (4)

DATE - 12/21/82

STORET	DESCRIPTION	RESUL	CONC	VERIFY	BY	VERIFY DATE	COMM CODE
LABORATOR	RY ANALYSIS :						
00095	SPEC COND	341,0000		G	LCC	12/13/82	
00403	PH LAB	7.9000		G	HUS	12/13/82	
00530	RES TOT NONF	18.0000	NG/L	6	HHJ	12/15/82	
00610 .	T NH3-K	0.2500	MG/L	G	ICB	12/10/32	
00615	T 1402-N	0.0700	KG/L	6	ICB	12/13/82	
00620	T NG3-N	2.1300	HG/L	6	ICB	12/13/82	
24400	PHOS-T NG/L	0.2700	NG/L	G	PLF	12/16/82	
00940	CHLORIDE	27.0000	MS/L	6	ICB	12/13/82	
00951	F.TOTAL	0.4000	MG/L	G	ICB	12/15/82	

SAMPLE COMMENTS

NO SAMPLE COMMENTS
TOTAL NUMBER TEST FOR THIS SAMPLE

.700:509 CANDE 32.400; YOU ARE LABAP04(88)

			,
REV. 1-62	Commonwealth of Pennsylvania Department of Environmental Resources	LAS. Number	Q
Metal	BUREAU OF LABORATORIES WATER OR WASTE QUALITY REPO		
ő _i	all Chemical Analyses expressed in MGA. Unless otherwise specified	(Red) 318	83
Pashed Tube	SE FACILI	TY .	COLL NUMBER
COUNTY MUNICIPALITY	PROGRAM COLL NAME	TYPE TR	STO ANALYSIS
CARD (3) ID CODE (ALL CARDS) 4-16 Coty Mun T Est Case	LATITUDE 410 LONGITUDE 11-	18 DATE 19-24 TIME 25-	
		1 6 3 17 8 3 18 3	
USGS-Q 30-341 BUREAU 35-37 AMIS SAM	PLENUMBER 38-43 STREAM NAME.	THE MALLEY	LATIVE POINT 58
TRIBUTARY TO: FULL DESCRIPTION WHERE SAMPLE TAKEN		ADDITIONAL	LAS ANALYSE
	2. (mHb s		
FIELD ANALYSES		B ANALYSES	
Type Sample S9-60	Chemist	Date Analyzed	
S, of Sample 91-62	Color (00000)	Total Solide (00500)	
Resear Sampled 63-64	Turb (00070)	Susp. Solids (90630)	
Proportional Composite Uniform 65	(00403) (00403)	Set Solids (00548)	TIT
Sample Temporal 66 Spotial	Gges. Cond (00096)	Total Dies Solids) (00615)	
Aliquota 57-68	Aik (00410)	NO,N (00615)	
Flow Estimated as		NO,N (00820)	1 1
Condition Above - 1 Normal - 2 Flood - 5 Below - 3 No Flow - 4	PH4 (00436)	NH,N (00610)	
CARD (2	Cald (90435)		
Stream Flow-CFS (90081) 3t 'low-MGU (50081)	T.O.C. (008e0)	Kjel-N (00825)	
Pipe Flow-MGD (50050)	C.O.D. (00340)	Hardness (00000)	
Gage Reading-Ft. (00085)	5-Day 8OD (00310)	Ca (00916)	
Temp (C) (00010)	P TD (00000)	Mg (00927)	
pH (00400)	U-Tot ug/1 (01106)	(SQ.) (00946)	
p.o. (00300)	Cd-Tot ug/1 (01027)	(00040)	
CI (50060)	Cr-Tot ug/1 (01034)	(00951)	
Hal Br (71871)	Cu-Tot ug/1 (01042)	MBAS (38260)	
I (71868) Spec Cond (00094)	Fe-Tot ug/1 (01045)	Phenois Dr. (46002)	
Appearance (48001)	Mn-Tot ug/1 (01055)	Ug/1 Ds (32730)	
		Cyanide (00720)	<u> </u>
How Shipped LUC Date ()	Ni-Tot ug/1 (01087)		<u> </u>
Legal Seal Nonu	Pb-Tot ug/1 (01031)		
Received by Condition of Sand O	Zn-Tot ug/1 (01092)		

ORIGINAL



WATER AND WASTEVATER REPORT SAMPLE NUMBER - 8308749

COLLECTOR - N. SHUP WON'T

COLLECTOR NO - 0117052

ESTAB - BISHOP TUBE

CASE NAME -

FACILITY -ID CODE - NONE

MON STATION NUMBER - 000

SAMPLING DATE - 3/17/83 TIME - 8:30 LAT - 00:00:00.0 LONG - 00:00:00.0

TYPE - 05 SDURCE - 01 STD ANAL - 500 RECEIVED ON - 3/18/83

REPORT REVIEWED BY 2 DATE - 3/28/83

	(1	7) (4	(u) (+)(u) (+)	(u) (4	'				
STORET	DESCRIPTION		RESULT	CONC	VERIFY	8Y	VERIFY DATE	CONH	CODE
LABORATOR	Y ANALYSIS :								
00095	SPEC COND		270.0000		6	HUS	3/21/83		
00403	PH LAB		7.3000		6	HYS	3/19/83		
00515	RES DISS/105		224.0000	MG/L	G	LHH	3/22/83		
00610	T NH3-H		0.0700	MG/L	G	YET	3/19/83		
00615	T NO2-N		0.0260	HG/L	G	₩ET	3/19/83		
00620	T NO3-N		2.8300	MG/L	G	WET	3/19/83		
26900	9H0S-T H6/L		0.0800	MG/L	6	ICB	3/22/83		
00940	CHLORIDE		29.0000	MG/L	G	WET	3/19/83		
00945	SO4 TOT		20.0000	HG/L	G	ICB	3/22/83		
00751	F,TOTAL		1.5000	MG/L	6	ICB	3/22/83		
01027	CD TOT UG/L	<	0.2000	UG/L	6	PHL	3/22/83		
01034	CR TOT UG/L	<	10.0000	UG/L	G	₩ET	3/25/83		
01042	CU TOT UG/L		10.0000	UG/L	G	₩ET	3/25/83		
01045	FE TOT		110.0000	US/L	G	WET	3/25/83		
01051	PB, TOTAL	<	5.0000	UG/L	6	BH!_	3/22/83		
01053	MN TOTAL		50.0000	UG/L	G	VET	3/25/83		
01067	NI,TOTAL		10.0000	UG/L	G	HET	3/25/83		
01092	ZNATOT UGAL		20.0000	UG/L	E	WET	3/25/83		
01105	AL, TOTAL		220.0000	UG/L	G	ICB	3/23/83		

SAMPLE COMMENTS

NO SAMPLE COMMENTS

TOTAL MUMBER TEST FOR THIS SAMPLE

10

(keg) Obicinat

(II

Fixed Samples					35805	
ER-81.13 REV. 1-82	-	DEPARTMENT OF E	LETH OF PENNSYLVANIA NYIRONMENTAL RESOURCES OF LABORATORIES	LAB. Rumb		M. "
	_ ,	WATER OR WAS	STE QUALITY REPOR	T Dete Recei	ad 20	
1 Metals	-	ALL CHEMICAL MG/L UNLESS	ANALYSES EXPRESSED IN OTHERWISE SPECIFIED		12100	
STABLISHMENT ALLE	CAS	E	FACILITY		COL	LL NUMBER
Sustrap Sube		PROGRAM	COLL NAME			ANALYSIS
Chester & W	Yul	LATITUDE 4	LONGITUDE 11-18	DATE 19-24	0 5	KIN:D 29
		Fac		M D Y	Hr Min	5 6
JSGS-Q 30-34 BUREAU 35-37 AMI	` 1 ~	LE NUMBER 36-43	STREAM NAME 44-67	'	RELATI	VE POINT 58
RIBUTARY TO:	10	1/1/1/13	17 2 4 1 1 1 1 4	ساخدا الأاعل	APONTIONAL LAB	ANALYSES
ULL DESCRIPTION WHERE SAMPLE TAKEN	i i n i	Les .		To CY		
	2	bottles		RE	03/2	
FIELD ANALYSES			LAB AI	VALYSES JAIN		-05
ype Semple 59-00	5	Chemist	<u> </u>	Date Analyzed ENVIRON	MALTY PROPERTY	JFIVE -
of Sample 61-82	1	Color (000e0		Total Solids NGN 1800		
eason Sempled 65-64	7	Turb (*0070		Susp. Solids (00530		T
Proportional	4			J Set Solids (00545		
Emple Temporal				Total Diss Solids (00515		_
Spatial .		Spec Cond (00066	'			
Aliquots 67-88		Alk (00410		NO ₂ N (00815		
ow Estimated Measured	•	pH4 (00436)		NO ₃ N (00620		
ondition Above - 1 Normal - 2 Flood - 5 Below - 3 No Flow - 4	SO CARD (2)	pH8 Hot (70808		NH ₂ N (00810		
ream Flow-CFS (00081)		T.D.C. (00640)		Kjel-N (00825		
Flow-MGD (60061)		C.O.D. (00340)		<u> </u>		·
pe Flow-MGD * (50050)		5-Day BOD(00310		Hardness (00800)		\ _
age Reading-F1 (00065)		т 🗸 (00465		Ca. (00916)		
emp (C) (00010)		P 7D (00066	<u>' </u>	Mg (00#27)		
4 (00400)		AL-TOI UQ/1 (01106)		SQ. (00945)		TT
O. (00300)		Cd-Tot ug/1 (01027)		(00940)		77
C1 (50060)		Cr-Tot ug/1 (01034)		(00951)		
at 8r (71871)						
I (71986)		Cu-Tot ug/I (01042)		MBAS (38280) Phenois Dr. (46002)		
rec Cand (00094)		Fe-Tot ug/1 (01845)		ug/t Ds (32730)		
peerance (46001)		Mn-Tal ug/((01055)		Cyanide (00720)		
tor (01330)		Ni-Tal ug/1 (01067)				
ow Shipped CUSTODY LOG Date	12/9	Pb-Tot ug/1 (01051)		()		
gal Seal No						

(01092)

ADIOMICS

eceived by_____

(2)



WATER AND WASTEWATER REPORT SAMPLE NUMBER - 8235805

COLLECTOR - H. SHUP WOHI

COLLECTOR NO - 0117372

ESTAB - BISHOP TRIBE

CASE MAME -

FACILITY -

ID CODE - NONE

WON STATION NUMBER - 000

SAMPLING DATE - 12/09/82 TIME - 8:15 LAT - 00:00:00.0 LONG - 00:00:00.0

TYPE - 05 SOURCE - 01 STD ANAL - 500 RECEIVED ON - 12/10/82

SEAL NO(S)

REPORT REVIEWED

DATE - 12/21/82

STORET	DESCRIPTION		RESULT	CONC	VERIFY	BY	VERIFY DATE	CONN	CODE
LABORATORY	Y ANALYSIS :								
00095	SPEC COND		326.0000		G	LCC	12/13/82		
00403	PH LAB		7.7000		G	HUS	12/13/82		
00610	T NH3-N		0.3000	HG/L	S	ICB	12/10/82		
00615	T NO2-N		0.0360	MG/L	G	ICB	12/13/82		
00620	T H03-N		2.8200	MG/L	6	ICB	12/13/82		
00465	PHOS-T HG/L		0.1300	MG/L	G	BLF	12/16/82		
00940	CHLORIDE		31.0000	MG/L	G	ICB	12/13/82		
00951	F,TOTAL		2.1000	KG/L	G	ICB	12/15/82		
01027	CD TOT UG/L	<	0.2000	UG/L	G	BHL	12/14/82		
01034	OR TOT UG/L		30.0000	UG/L	G	LBS	12/17/82		
01042	CU TOT UG/L		20.0000	UG/L	G	LBS	12/17/32		
01045	FE TOT		90.0000	UG/L	G	LBS	12/17/82		
01051	PB.TOTAL	<	5.0000	UG/L	G	BHL	12/14/82		
01055	N TOTAL		100.0000	UG/L	G	LBS	12/17/82		
01067	NI,TOTAL		80.0000	UG/L	G	LBS	12/17/82		
01092	ZN.TOT UG/L		40.0000	UG/L	G	LBS	12/17/82		
01105	AL, TOTAL		450.0000	UG/L	G	ICB	12/20/82		

SAMPLE COMMENTS

NO SAMPLE COMMENTS
TOTAL NUMBER TEST FOR THIS SAMPLE 17

#B6700:509 CANEE 32.400; YOU ARE LABAP04(88)

(Red) Objectively

-			_	
ER-8L13 REV 1-82	DEPARTMENT OF EN	TH OF PENNSYLVANIA VIRONMENTAL RESOURCES	LAB. Number 231.5	
() rantala		F LABORATORIES		
() Williams	ALL CHEMICAL A	TE QUALITY REPORT :	Date Reciper 1	
			1RO NA	
Busheso Tube Co	CASE	FACILITY	y Joba No	HBER -8
COUNTY MUNICIPALITY	PROGRAM	COLL NAME	TYPE TR STO ANA	
Chester Ewhit	ti IW	m Shup	0 2 50	
CARD (3) ID CODE (ALL CARDS) 4-16	LATITUDE 4-1	0 LONGITUDE 11-18	DATE 19-24 TIME 25-28	KIND 29
2 1 1 1			14 612 NIV 410	حا
USGS-Q 30-34 BUREAU 35-37 AMIS	SAMPLE NUMBER 35-43	STREAM NAME 44-67	RELATIVE PO	INT 58
1 1 7 0 1	0 111 7 3	1418 LIITTLE	VAC E Y	
TRIBUTARY TO: FULL DESCRIPTION WHERE SAMPLE TAKEN	OF R+ 30		ADDITION OF LAW AND	AL 1SES
			D. 1844 104	
2	bottles		THE OF WHICH REAL	
FIELD ANALYSES		LAS ANALYSE	My 65 104.	
Type Sample 59-80	5	 	- MOIL	,
	Chemiet	Date Ar		-
So. (Sample 61-62	Color (00000)	Total S	olida (00500)	
Reason Sampled 63-64	Turb (00070)	Susp. S	Bolids (00530)	
Proportional				<u></u>
Composite Uniform 65	(00403)	Set Sol	ida (00645)	
Temporal 66 Spetial	Spec. Cond (00086)	Total C)iss Solids (00515)	
				===
Aliquots 67-68	Ark (00410)	N,ON	(00615)	
Flow Estimated ds Mestured	pH4 (00436)	NO ₃ N	(00620)	
Condition Abover - 1 Normal - 2 Flood - 5				
Denom - 2 140 LIDM - 4 .	PD (2) PH8 (00435)	NH.M	(00610)	
Stream Flow-CFS (00061)	T.O.C. (00680)	IQel-N	(00625)	
	C.O.D. (00340)	Hardne	(00900)	Ī
Pipe Flow-MGO (50030)	5-Day 800 00310)			<u></u>
Gage Reading-Ft. (00065)	T (00005)	[Ca]	(00916)	
Temp (C) {00010)	P TD (00666)	Mg \	(00927)	
			<u> </u>	
pH (00400)	(Al-Tot ug/1 (01105)	so,	(00945)	
p.o. (00000)	Cd-Tot ug/t (01027)	Cı	(00940)	
CI (50060)	'			
Ha) Br (71371)	Cr-Tot vg/1 (01834)		(00951)	
	Gu-Tot ug/1 (01042)	MBAS	(38260)	
[(71886)		Phenok	Dr. (45002)	
Spec Cond (00094)	Fe-Tot ug/1 (01045)	ug/		
Appearance (46001)	Mn-Tot ug/1 (01055)	Cyanid	(00720)	
Odor (07330)	≒∥		\ <u></u>	_
Octobron For	Ni-Tot ug/ I (01067)		_ ()	
How Shipped RIAC Date	15 Pb-Tot ug/1 (01051)		()	
Legal Seal No.	_1 i			
Received by	Zn-Tat ug/1 (01092)		_ ()	

ORIGINAL

Condition of Seal.



MATER AND WASTEMATER REPORT SAMPLE NUMBER - 8232815

COLLECTOR - N. SHUP WON'L

COLLECTOR NO - 0117348

ESTAB - BISHOP TUBE CO

Ewhite, Chen Co

CASE NAME - FACILITY -

ID CODE - NONE

WON STATION NUMBER - 000

SAMPLING DATE - 11/15/82 TIME - 14:40 LAT - 00:00:00.0 LONG - 00:00:00.0 TYPE - 03 SDURCE - 01 STD ANAL - 500 RECEIVED ON - 11/16/82 SEAL NO(S)

REPORT REVIEWED BY (b) (4)(b) (4)(b) (4)

DATE - 12/01/82

	-								
STORET	DESCRIPTION		RESULT	CONC	VERIFY	BY	VERIFY DATE	COM	CODE
ABCRATO	RY AMALYSIS :								
00095	SPEC COND		348.0000		8	LCC	11/16/82		
00403	PH LAB		8.0000		6	HIS	11/17/82		
00410	T ALK CACOS		78.0000	H8/L	B	HNS	11/19/82		
00610	T 1963-N		0.3600	XS/L	6	IC3	11/16/82		
00615	T NO2-H		0.0320	HG/L	8	IC	11/16/82		
00620	T 1403-H		3,2800	MB/L	6	ICB	11/16/82		
00665	PHOS-T HB/L		0.1100	MG/L	8	BLF	11/26/82		
00900	T HARD CACOS		110.0000	MG/L	_	ICB	11/18/82		
00916	CA, TOTAL		35,4000	NG/L	6	HRO	11/23/82		
00927	NG TOT HEAL		10.9000	MG/L	_	HRO	11/23/82		
00940	CHLORIDE		32,0000	HS/L	6	ICB	11/16/82		•
00945	SON TOT	•	25.0000	MG/L	6	ICB	11/18/82		
00951	F. TOTAL		3,4000	HG/L	Š	ICB	11/22/82		
01027	CD TOT US/L		0.2000	UG/L	6	BHL	11/19/82		
01034	CR TOT UB/L	•	30.0000	UG/L	Š	LBS	11/30/82		-
21042	CU TOT US/L		10.0000	UG/L	6	LBS	11/30/32		
01045	FE TOT		70.0000	UB/L	ŝ	LBS	11/30/82		
01051	PB, TOTAL	(5.0000	US/L	6	BHL	11/19/82		
01055	MM TOTAL	•	80.0000	UE/L	6	LBS	11/30/82		
01047	NI, TOTAL		30.0000	UG/L	6	LBS	11/30/82		
01092	ZN. TOT US/L		20.0000	UG/L	ē	LBS	11/30/82		
41415	SELLAI AM.F		-414444	00/ L	•		11/ A4/ A#		
01105	AL. TOTAL		600.0000	U6/L	6	7800	11/24/82		~

SAMPLE COMMENTS

NO SAMPLE COMMENTS

#B6700:509 CANDE 32.400; YOU ARE LABAP04(88)

(Red)



ASSENCE NO. 11



HAZARDOUS WASTE INSPECTION REPORT TSD Facilities - Part A

Date of inspection 10/25/83 Time start 0800. Time	e finish
Name of inspector Frank Holines	
Company, installation name Beden Ticle Co.	
Location Pt 30 and Malin Rd. Frage	
County Charles . Municipality E. Whiteless	1 tun
Identification number PADS/86309	
Name of responsible official Miles Tolnam	
Jele Project Engineer	
Mailing address R+ 21 + Malin Rd. France Pa	9355
Area code and phone no. 2/5-647-3450	
Name of person interviewed Mein Tohnson	
Title	
Mailing address (if different from above)	• • • • · · · · · · · · · · · · · · · ·
Area code and phone no.	•
Site characterization:	
a	sical, [] biological
b. Storage - D containers, D tanks, D surface impoundment	
c. Disposal - land treatment, landfill, incineration	
d. 🖊 Use, 🖊 reuse, 🏳 recycle, 🖊 reclaim	ment
2. Does the facility generate hazardous wastes? Yes No	•
3. Types of hazardous waste produced by Hazardous Waste Number:	
N/A	

4. Are hazardous wastes transported off-site by the facility? / Yes No

HAZARDOUS WASTE INSPECTION REPORT TSD FACILITIES - PART B General p.1

<u> -</u>				1- NON-COMPLIANCE, Z-COMPLIANCE, 3-NOT APPLICABLE, 4-NOT DETERMINED (Red)	
CC	STAI	<u> </u>		REQUIREMENT	CHAPTER CITATION 75.265
-	Z ✓	2	4	Part A permit application submitted	(a) (2),(z)
	λ				
<u>-</u>	Δ		_	Identification number .	(b)
		X		Wastes accepted at facility transported by haulers licensed to transport liazardous waste by the Department	(b) (1)
		X		Waste streams not covered by permit approved by the Department before accept	ance (c)
_		X	-	Chemical and physical analyses repeated as required .	(c)(1)
		X		All waste shipments inspected and sampled	(c) (2)
	j ,	X		Waste analysis plan on-site	(c) (3)
	X			24 hr. surveillance at active portion	(d) (2) (i
•	X			Artificial barrier at active portion	(d) (2) (i
-	X	•		Proper signs posted and logible at a distance of at least 25 ft.	(a) (3)
;	X			Inspection schedule on-site	(e) (2)
-	X			Maintenance schedule on-site for equipment or structures which reveal deterioration or malfunction	(ej (4)
!	X			Immediate remedial action taken where a hazard is imminent or has already occurred	(e) (4)
	χ			On the job or classroom personnel training program	(£)
	<u> </u>	L		Records retained for each employee at facility of training, job title, and job description	(f)(6),
		V		Ignitable or reactive wastes separated from source of ignition or reaction	(g) (l)
		Χ		No smoking signs displayed where there are hazards from ignitable or reactiv	(g) (1)
}		X		Treatment, storage, disposal of ignitable or reactive wastes or mixing of incompatible wastes or materials conducted according to requirements	(g) (2)
-	X			Facility equipped with internal alarm system capable of providing immediate emergency instruction to personnel	(h) (2) (:
<u> </u>	X			Facility equipped with a device for surmoning outside emergency assistance	(h) (2) (.
-	K			Facility equipped with fire control, spill control, and decontamination equipment	(h) (2) (:
	X			Pacility equipped with water at adequate volume and pressure to supply fire control equipment	(h) (2) (:
	X			Facility communications or alarm systems, fire control, spill control, and decontamination equipment tested and raintained.	(11) (3)
	X			Adequate aisle space maintained to allow unobstructed movement of personnel and equipment during emergencies	(h) (6)
	X			Contingency plan on-site and implemented	(1)(1)
	X			Contingency plan describes action taken by personnel in the event of an emergency	(i)(3)

HAZARDOUS WASTE INSPECTION REPORT TSD FACILITIES - PART B General p.2.



				1- NON-COMPLIANCE, Z-COMPLIANCE, 3-NOT APPLICABLE, 4-NOT DETERMINED	
•	MPI STAT	<u>NS</u>		REQUIREMENT ORIGINAL (Rod)	CHAPTER CITATION 75.265
Ė	$\overline{\chi}$		-	Contingency plan contains an up-to-date list of names, addresses and phone numbers of all persons qualified to act as emergency coordinator.	(i) (6)
	X			Contingency plan contains list of emergency equipment including location, physical description and capabilities of each item	(i) (7)
	X			Contingency plan contains an evacuation plan if there is a possibility that evacuation could be necessary	(i)(8)
	X			One employee designated as the primary emergency coordinator either on the premises or on call.	(i)(ll)
	·	X	1	Facility accepting only PA manifests	(5)
	X			Manifests properly completed and routed within time limits (24 hrs.)	(j) (2) (
		X	•	Manifest discrepancies resolved or reported within time limits	(j) (10)
	X			Written operating record maintained on the premises	(k)
	X			Written operating record contains description and quantity of wastes and method of treatment, storage or disposal	(k) (2) (
	X			Written operating record contains location and quantity of each hazardous waste	(k) (2) (
٠		X		Written operating record contains results of waste analyses and treatability tests	(k) (2) (:
	X			Written operating record contains reports and details of all incidents	(k) (2) (:
	X			Written operating record contains records and results of all inspections	(k) (2) (
		X		Written operating record contains required monitoring, testing, and analytical data	(k) (2) (·
		X		Written operating record contains closure and post-closure cost estimates	(k) (2) (·
	<u>X</u>			All records retained on premises and available for inspection	(1)
	X			Quarterly reports submitted to the Department .	(m)
	1			Emissions, discharges, fires, explosions, and groundwater contamination . reported as required	(m) (2)
		X		Groundwater monitoring wells located at approved sites	(n) (2)
	_	K		Adequate protection of groundwater monitoring wells	(n) (7)
		X		Groundwater sampling and analysis plan on the premises	(n) (8)
	_	X		Groundwater quality assessment and abatement outline on the premises	(n) (14)
	K	_		Closure plan on the premises and up-to-date	(o) (2) -
_	_	X		Post-closure plan on the premises and up-to-date	(0) (10)
_	X	_		Annual closure cost estimate on the premises and up-to-date	(p) (2)-
		<u>/</u>		Annual post-closure cost estimate on the premises and up-to-date	(p) (5) -
	1		1		1

TREATMENT, STORAGE, DISPOSAL FACILITIES - STORAGE (Containers and Tanks)

7	ς		2	ĸ	ς
	_	-	-		_

				1- NON-COMPUNICE, Z-COMPUNICE, 3-NOT APPLICABLE, 4-NOT DETERMINED ORIGINAL	
	AT	<u> </u>	╛	(Pad)	CHAPTER CITATION
1 2	<u>}</u>	<u> </u>	+	Containing represent to present looks and spills	(q) (l),(
- 2	(╬	4		```
_}	4	4	_		(q) (2)
_\X	4			Containers are closed during storage	(q) (3)
	N				(q) (5)
				Containers holding ignitable or reactive wastes are set back 15 m (50 ft) from property line.	(q) (6)
	7	Y		Satisfactory procedures followed for handling incompatible wastes.	(q) (7),(
	1	N		Incompatible wastes separated or protected from other materials.	(g) (9)
1	7				Act 97 n 403(b)
		X		Precautions taken for tanks holding ignitable, reactive, or incompatible waste or material	(r) (2)
	Z			Tanks managed to prevent leaks, rupture, corrosion, or otherwise failing.	(r) (3)
		X		Uncovered tanks operated to ensure at least 60 cm (2 ft) of freehoard.	(r) (4)
		X		Uncovered tanks equipped with an overflow alarm and an overflow device to a standby tank with a capacity equal to or exceeding the freeboard requirement	(r) (4)
		X	Ì	Continuously fed tanks equipped with a means to stop the inflow	(r) (5)
X				Containment structure with a capacity that equals or exceeds the largest above ground tank volume plus a reasonable allowance for precioitation based on local weather conditions and plant operations provided for liquid storage in above ground or partially above ground tanks.	
		X		Waste analyses and/or trial tests conducted on hazardous wastes substantial? different from wastes previously treated or stored; or chemically treat hazardous waste with a substantially different process than any previously used in that tank.	(r) (7)
ľ	χ			Discharge control equipment inspected once each operating day.	(r) (8) (
		X		Monitoring equipment data inspected once each operating day.	(r) (8) (
	X			Liquid level of tanks inspected once each operating day.	(r) (8) (
	X			Construction materials of tanks inspected weekly.	(r) (8) (
	_	X		Construction materials of discharge confinement structures and area immediately surrounding inspected weekly.	(r) (8) (
		V		All nazardous waste removed from tanks and related appurtenances at closure.	(r) (9)
		y		Placement of ignitable or reactive waste only with the Department's approval	(r)(10)
	·	X		Covered tanks in which ignitable or reactive waste is treated or stored moute uses buffer your requirements.	r)(1))
		-			

HAZARDOUS WASTE INSPECTION REPORT Part C - Comments Identification number PADOSNEC Municipality E. Whiteless rolation were This inspection report is official notification that a representative of the Department of Environmental Resources, Bureau of Solid Waste Management, inspected the above installation. The findings of this inspection are shown in this report. Any violations which were uncovered during the inspection are indicated. Violations may also be discovered upon examination of the results of laboratory analyses and review of Department records. Notification will be forthcoming, confirming any violations indicated herein and listing any additional violations. Person Interviewed (signature) Inspector (signature)



REFERENCE NO. 12

(##) ## (##) ## (##) ## (##)



Department of Environmental Resources

1875 Tew Mope Street Morristown, PA 19401 215 631-2420

November 3, 1983

Mr. Hiers Johnson Bishop Tube Company Noute 30 and Malin Road Frazer, PA 19355

> Re: Mazardous Weste Inspection October 25, 1983

NOTICE OF VIOLATION

Dear l'm. Johnson:

This letter is to confirm the findings of the Department's referenced inspection of your hazardous waste activities. Pequirements for hazardous waste facilities are contained in Chapters 75.260 through 75.267 of the Rules and Regulations of the Department. Violations of applicable sections of these regulations found during our inspection are as follows:

- 1. The outside hazardous waste storage tanks are not contained. 75.265(r)(6).
- 2. A small velve leaking on one of the acid rinse water tanks. 75.265(h)(1).

You are hereby notified of both the existence of these violations as well as the need to provide for their prompt correction. Toward this end, you are to submit to the Department within fourteen (14) days a proposed program and schedule for abatement of these violations. The Department's inspection report contains time periods of completion of remedial actions. These reports are either enclosed or have been previously supplied to you. If your proposed abatement program indicates certain corrections cannot be completed within these time periods, you are requested to supply justification for any extensions.

This letter does not waive, either expressly or by implication, the power or authority of the Commonwealth of Pennsylvania to prosecute for any and all violations of law arising prior to or after the issuance of this letter or the conditions upon which the letter is based. This letter shall not be construed so as to waive or impair any rights of the Department of Environmental Fesources, heretofore or hereafter existing.



fir. Mers Johnson November 3, 1983 - 2 -

This letter chall also not be construed as a final action of the Department of Environmental Resources.

If you have any questions concerning this matter, please feel free to contact man at 631-2420.

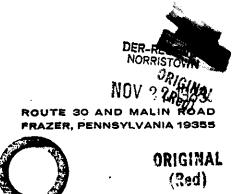
Very truly yours,

FRANK POLYTS Solid Waste Specialist

M. Chup, Water Quality Management Division of Mazardous Waste Re FR6-35







PHONE: (215) 647-3450 TWX 510-868-5428 TELEX 83-4511

November 18, 1983

Pennsylvania Department of Environmental Resources 1875 New Hope Street Norristown, PA 19401

Attention: Mr. Frank Holmes

Reference: Notice of Violation re Hazardous Waste Inspection on

October 25, 1983

Gentlemen:

The referenced letter was not received until November 15, as I told Mr. Victor Janosik by telephone today.

The leaking valve was turned off upon discovery and was corrected right after Mr. Holmes departed. The plastic valve that was dripping had the handle installed backwards, so that the valve could be rotated past the OFF position. I turned the valve off, removed the handle and put it into my desk drawer. I am the only person who uses that sampling valve.

Workman had been working in that area on October 26, installing a filler pipe for the new hydrofluoric acid storage tank. Evidentially someone bumped into that sampling valve and moved the handle just enough to cause it to drip. We are confident that removing the valve handle will prevent reoccurrence.

Containment of the outside hazardous waste storage tanks will be proposed by a plan to be submitted by Bishop Tube by December 15, 1983.

Bishop Tube's Part B application to D.E.R. is due by December 1, only six working days from today. In that application we shall state that a plan for



Pennsylvania Department of Environmental Resources November 18, 1983 Page -2-

ORIGINAL (Red)

containment will be submitted by December 15. There is just not enough time to submit that plan earlier.

We respectfully request that the additional time for submission of the plan for containment be approved.

Very truly yours,

BISHOP TUBE COMPANY

Miers C. Johnson Project Engineer



REFERENCE NO. 14



Department of Environmental Resources 1875 New Hope Street Norristown, PA 19401 215 631-2415

Tebruary 10, 1982

Christiana Metals Corporation 200 Fast Rosedale Avenue West Chester, PA 19380

Attention: Mr. D.V. Hedges
President

CONSENT ORDER AND AGREEMENT

MM, THEREFORE, on this _____ day of February, 1982 after full and complete negotiations of all matters set forth in this Consent Order and Agreement, both the Department and Bishop Tube Company ("Bishop Tube"), upon cutual exchange of covenants herein and intending to be legally bound by this Consent Order and Agreement, agree as follows:

- 1. Bishop Tube, Route 30 and Malin Poad, Frazer, Chester County, Pennsylvania, is a Division of Christiana Metals Corporation, 200 East Rosedale Avenue, West Chester, Chester County, Pennsylvania; and,
- 2. Bishop Tube is a corporation qualified to do business in the Cormonwealth of Pennsylvania; and,
- 3. On June 9, 1931 mitric acid from a storage tank outside of Bishop Tube entered an adjacent hydrofluoric acid storage tank through a common piping connection and caused the release of acid finnes from the vent for the hydrofluoric acid tank. These finnes were carried by the prevailing winds eastward toward the General Marron Village housing development. About 500 residents of the village were evacuated from their hones for about four hours to escape the effects of the finnes. Theyen people were treated at Paoli Memorial Hospital for various respiratory ailments, nausea, etc. and released. One fireman was admitted for further treatment and released on June 13, 1981; and,
- 4. On June 10, 1981 the mixed acid sludge remaining in the hydrofluoric acid storage tank after it was drained following the fiming incident on June 9, 1981 ate through the bottom of the tank and caused a second release of acid fimes. Residents of General Marron Village were again evacuated from their homes as a precautionary measure. Five people were treated for respiratory problems at Paoli Memorial Mospital and released; and.

Christiana Metals Corporation Webcurry 10, 1982

- 5. The Commonwealth of Pennsylvania, Department of Environmental Resources ("Department") has determined that the above mentioned fuming incidents caused injury to trees downwind of Bishop Tube; and,
- 6. The Department has determined that the fugitive and malodorous emissions from Bishop Tube's hydrofluoric acid storage tank on June 9 and 10, 1981 were in violation of Sections 3 and 13 of the Air Pollution Control Act, 35 P.S. Section 4001, et seq ("Act") and Sections 121.7, 123.1 and 123.31 of Chapters 121 and 123 of the Rules and Regulations of the Department, 25 Pa. Code Chapters 121 and 123 ("Rules and Regulations"); and,
- 7. Subsequent to the two firming incidents in June, 1981 the Department determined that malodorous emissions from Bishop Tube's "pickle house" enter the outdoor atmosphere under normal operating conditions in violation of Section 123.31 of the Department's Rules and Regulations; and,
- 8. Bishop Tube has indicated its willingness to comply with the Act and the air pollution regulations promulgated thereunder; and,
- 9. The Department and Bishop Tube met on October 5, 1981 and agreed to settle voluntarily the Department's claim for civil penalties against Bishop Tube for the figitive and malodorous emissions that occurred on June 9 and 10, 1981 on the basis of Bishop Tube's payment of Ten Thousand Dollars (\$10,000.00) to the Clean Air Fund of Pennsylvania.
- 10. Bishop Tube shall make payment of Four Hundred Dollars (3400.00) immediately upon execution of this agreement. The remaining Mine Thousand Six Hundred Dollars (\$9,600.00) shall be payable in monthly installments of Eight Hundred Dollars (\$800.00) each due on the tenth day of the month. The first monthly payment is due March 10, 1982. All checks shall be made payable to "Clean Air Fund of Pennsylvania" and be forwarded to:

Mr. Porris Palin, Chief Division of Abatement and Compliance Bureau of Air Quality Control 18th Floor, Fulton Building 200 Porth Third Street Harrisburg, PA 17120

Payments shall be acompanied by form 15. ER-AQ-3, a copy of which is attached hereto.



- 11. In order to bring its "pickle house" into compliance with the Air Pollution Control Act and all applicable provisions of the Department's Rules and Regulations during normal operations, Eishop Tube shall:
 - a. On or before February 23, 1932 submit to the Department's Norristown Regional Office two (2) copies of an application for Plan Approval to construct and operate a new packed tower scrubber to control acid fumes from the "pickle house". By issuing any such Plan Approval, the Department does not represent, guarantee or stipulate that said installation will bring Bishop Tube's "pickle house" into compliance with the Air Pollution Control Act and the Rules and Regulations of the Department. Vents from the outside storage tanks for hydrofluoric acid and nitric acid shall be tied into the new packed tower scrubber along with all acid pickling tanks located inside the plant.
 - b. On or before April 30, 1932 place purchase orders for the new packed tower scrubber to be installed on the "pickle house". Proof thereof by confirming letter shall be submitted to the Department within ten (10) days after such orders are placed.
 - c. On or before July 31, 1982 begin on-site construction or installation of the new packed tower scrubber for the "pickle house" that has been given Plan Approval by the Department.
 - d. On or before September 30, 1982 complete on-site construction or installation of the new packed tower scrubber for the "pickle house" that has been given Plan Approval by the Department.
 - e. On and after October 31, 1982 operate the "pickle house" in compliance with all applicable provisions of the Air Pollution Control Act and all applicable Rules and Regulations of the Department.
- 12. In the event that Pishop Tube fails to comply with the final compliance date of October 31, 1982 specified in Paragraph 11(e) above, Bishop Tube shall make an additional payment of Eight Hundred Dollars (\$800.00) per month to the Clean Air Fund of Pennsylvania until final compliance is achieved. In no event shall final compliance be delayed beyond December 31, 1982. Payment shall be made in the same manner as described in Paragraph 10 above.
- 13. Commencing on January 1, 1982, Bishop Tube shall prepare to submit to the Department's Forristown Regional Office quarterly progress reports



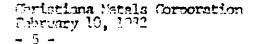
Christiana *etals Corporation February 10, 1982

including, inter alia, information on the availability of equipment and materials, until such time as Sishop Tube is notified in writing by the Department that such reports are no longer necessary to effectuate the purposes of this Order. Progress reports shall be due on April 15, 1982; July 15, 1982; October 15, 1982; and January 15, 1983, at a minimum.

- 14. During the time period covered by this Consent Order and Agreement,

 Bishop Tube shall take all reasonable interim measures suggested by the

 Department to keep the above-described malodorous emissions to a minimum.
- 15. Pothing herein shall be construed to preclude Bishop Tube from discontinuing the operation of any source of air pollution which is the subject of this Consent Order and Agreement. Any such discontinuance shall, for the duration thereof, have the same effect as compliance with the Department's Regulations. However, if Bishop Tube does discontinue said source's operation, it shall promptly so notify the Department in writing. Potwithstanding any provisions of this Consent Order and Agreement, if a source is out of operation for one year or more, it shall be subject to Section 127.11 of the Department's Regulations.
- 16. In the event that Bishop Tube fails to comply with Paragraph 11 by the dates specified therein and said failure is caused by strikes, lockouts, floods, fire, explosions, extraordinary weather conditions, vandalism, riots, wars, sabotage, civil disturbances, or any other cause beyond the control of Wishop Tube, Acts of God, or delays in the construction, installation, or delivery of equipment or material, which delays are not within the control of Bishop Tube, its agents, servants, employees, successors and assigns, or which Bishop Tube by exercising reasonable diligence is unable to prevent, then Bishop Tube shall be relieved of its obligations to comply with Paragraph II within the times specified therein and the time for compliance shall be extended one day for each day of delay so incurred. Bishop Tube shall be entitled to the benefits of this paragraph only if it submits a written report within fifteen (15) days of the occurrence of each delay to the Regional Air Pollution Control Engineer explaining the reasons for such 🔩 celay.
- 17. This Consent Order and Agreement shall have the force, effect and be enforceable as an Order of the Department issued pursuant to the Pennsylvania Air Pollution Control Act. Bishop Tube, recognizing its right to appeal any Order of the Department, hereby waives its right to appeal this Order.





- 13. So long as Bishop Tuba complies with the provisions and requirements set forth in this Consent Order and Agreement within the times specified for such performance, unless otherwise excused hereunder, the Department shall not institute any action at law or in equity for the violations of the lews of the Commonwealth alleged in Paragraph 3-7 hereof; but, if Bishop Tube fails to fully comply with the provisions and requirements hereof in a timely manner, unless otherwise excused herounder, the Department reserves the right to institute any appropriate action based upon any violation whether or not said violation predates Bishop Tube's failure to fully comply with this Consent Order and Agreement.
- 19. The Department reserves all rights to enforce this Consent Order and Agreement and to prosecute any violations of the Air Pollution Control Act and/or the Rules and Regulations promulgated thermunder, except those explicitly vaived in this Consent Order and Agreement. This Consent Order and Agreement shall not be considered as a limitation or abridgent of the Department's rights and duties pursuant to energency control strategies under Section 6.2 of the Act, 35 P.S. Section 4006.2.
- 20. In the event of a material breach, the Department may, at its option, in addition to the remedies prescribed berein, proceed with any action at law or in equity to bring about compliance with the Pennsylvania Air Pollution Control Act and the Rules and Demulations of the Department.
- 21. It is the intent of the parties berein that the clauses are severable and should any part of the clauses berein be declared by a court of law to be invalid and unenforceable, the other clauses shall remain in full force and offect as between the parties, their successors, assigns, agents and servants.
- 22. Nothing herein contained shall be construed to relieve or limit Bishop Tube from complying with the terms and conditions of any plan approval or permit existing, or bereafter issued to Bishop Tube by the Department.
- 23. It is agreed that any changes, additions or amendments to this Consent Order and Agreement shall be set out in writing as an amendment and signed by the parties bereto.
- 24. This Consent Order and Agreement does not grant a variance from any requirement of the Air Pollution Control Act (35 P.S. Section 4901,

Al

Caristiana Metals Corporation February 10, 1932

et seq), the Clean Air Act (42 U.S.C. Section 7401 et seq.), or any regulations promulgated thereunder, nor does it purport to modify any requirement of Pennsylvania's State Implementation Plan as approved under Section 110 of the Clean Air Act. Surther, this Consent Order and Agreement does not constitute a Consent Order and Agreement under the provisions of Section 113(d) of the Clean Air Act. Notice is hereby provided to Bishop Tube that it may be subject to additional penalties for non-compliance with the Pennsylvania State Implementation Plan under Section 120 of the Clean Air Act.

25. Attached hereto as Exhibit A is evidence of a resolution of the Board of Directors of Christiana Metals Corporation authorizing the signatures for Bishop Tube Company to enter into this Consent Order and Agreement in behalf of the Bishop Tube Company.

FOR: COMMONIFALTH OF PENNSYLVANIA

DEPAREMENT OF ENVIRONMENTAL RESOURCES

DATE

N. Pao Kona

Regional Air Pollution Control Engineer

Ken Gelburd

Attorney for the Commonwealth

FOR: BISHOP TUBE COMPANY

DATE

Corporate President or Vice-President

Corporate Seal

Corporate Secretary or Treasurer

Attorney for the Corporation

`UT!171/.1



RESERVENCE NO. 15

POTENTIAL HAZARDOUS WASTE SITE

IDENTIFICATION AND PRELIMINARY ASSESSMENT

HEGION STORMAN

Contention, First and the first seven in and interest and the first in a post of the first and the f
--

Θ

POTENTIAL HAZARDOUS WASTE SITE

 REGION	डराट गणान दून हुव ६० नह डराहर गणान दून हुव ६० नह
}	12

NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. In information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional submitted.

GENERAL INSTRUCTIONS: Complete Sections I and III through X as completely as possible before Section II (Preliminary Anaexament). Fife this form in the Regional Hazardous Waste Log File and subsit a copy to: U.S. Environmental Protection Agency; Site Trucking System; Hazardous Waste Enforcement Task Force (EN-335); 401 M St., SW; Washington, DC 20460.

1. SITE I	DESTIFICATION	
A. SITE HAME	B. STREET (or other identifier)	
Beckoo labe Comman	D. STATE E. ZIP CODE F. COUNTY HAME	
C. CITY :	D. STATE E. ZIP CODE F. COUNTY HAME	
Faguer	Pa 19355 Chester	:
G. OWHER/OPERATOR (II known)	The state of the s	
1. NAME	12. TELEPHONE NUMB	ER *
$y \cdot a \rightarrow a \cap a$.
Beston Tule Compan	ng 2/5-647	:-5450
H. TYPE OF OARL TEHEN	J	•
1. FECERAL (2. STATE 3. COUNTY 4. M.	BURGIPAL (E. PRIVATE ()6. DIKKIOWR	
I. SITE DESCRIPTION		
The company manufactures and	I sells special slambes tu	lierie
1		٠.٠
1. HOW IDEN TITLES then, chizen's complaints, USHA citations, etc.		
1. 1104 IDENTIFIED ILLE, chizen's complaints, USHA citations, att.	(in the several cond	3
- Comparing the again and property	(ino., day,	a yr.y
Storen in tall of Cov. En trumment	in on 6/23/8/	
L. PRINCIPAL STATE CONTACT		
1. NAME	2. TELLPHONE NUMB	E.P
Franks Holmer	2/5.631-24	120
	SMENT (complete this section list)	-<
A. APPARENT SERIOUSHOLD OF PROBLEM	Sacre (complete that accept man)	
	ONE The UNKNOWN	
1. HIGH [2, KEDIUM X3. LOW []4 NO	t_ls bakaban	
]
D. RECOMMENTATES		
1. NO ACTION HEREDED (no hexard)	[]] 2. IMMEDIATE SITE INSPECTION REEDED	
	A. TENTATIVELY SCHEDULED FOR	
3. SITE INSPECTION REEDED	And the state of t	ļ
A. TENTAT FELY SCHEDULED FOR:	A. WILL BE PERFORMING BY:	
		l
b. WILL BE PERFORMED BY:	· V.	
	(X4. SITE HISPECTION REEDED (four priority)	
——————————————————————————————————————		
C. PREPARER INFORMATION		
1. NAME	2. 11 CI PHONE RUMBER 2 DATE (CO.	u 765 a Al 3774)
Eranle Holmen	215-631-2420 11/29	1.c.2
III. Sive	E DG - A DATION	- · · · · · · · · · · · · · · · · · · ·
A. SITE STATUS	The control of the first of the control of the cont	· · · · · · · · · · · · · · · · · · ·
	1 2 2 214. B repeated to the chieff like the delign dis	j
military which was the manual after which an letter test	where IT is the same that make to each in children like the children site in equal to be continued and the late to the first and the	70 (B) 77 (
for waste trouthwit, 2 rays, in diagrams (white w)	the section of the state of the section of the sect	. 15 W Chengary
(asatiys)		
B. IS GENERATOR OF CITE!		
1. HO Z. YES (Apportly &	grammatik hamidight SIC (Code). 33/7,3356	1
	- <u>-017 + , 305 6 </u>	1
C. AREA OF SITE (In a res) D. IF APPARENT SERIOL	UPSECS OF SIVE IS HIGH, SPECIFY COORDINATES	
1. LATITUDE (degle-min-		j
O acres		Į
L. ARE THERE DUILDINGS ON THE SELET	en em er manme en antennet er manmeren en er rader er rene en	
[] 1, 119 M 2, 1255 (appoints):	6 11 111	,,
In May	large bulling - myla penen to	Tree
77070-2 (10-77)	Contin	a Chirtheology

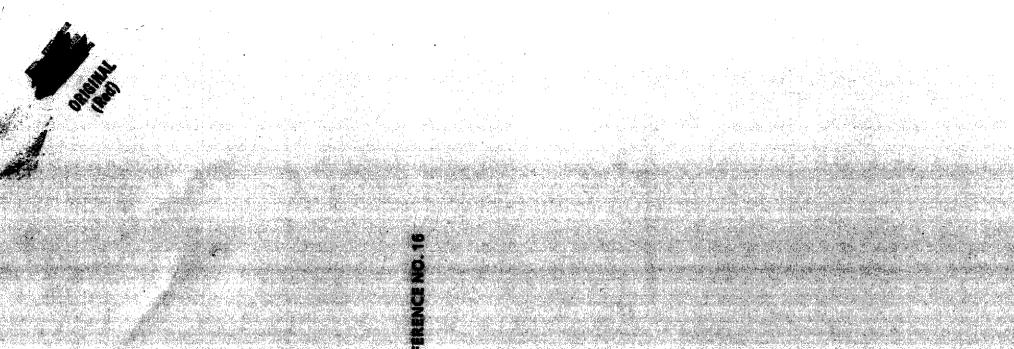
Continued From From	· · · · · · · · · · · · · · · · · · ·	IV.	CHARACTERIZATI	ЮН	OF SITE ACTIVIT	Y		
ndicate the major si	te netivity(ics)						ropriate boxe	20
A. TRANSPOR	×		STORER	×	C. TREATE		×	And Stagen
1. BAIL	^	1. PILE		- -	. FILTRATION		I. LANDEI	
Z. 3HIP		2. SUNFAC	EIMPOUNDMENT		HOMERATION		2. LANDE	nu -
2. UARGE	V	1. DRUMS			. VOLUME BLOUCTS	OH	1. OPEN D	UILE
4. TRUCK	i>	4. TANK, A	BOVE SROUND	74	HEEYCLING/HECC	VERY	I. SURFAC	E IMPOUNDMENT
S. PIPCLING		B. TANK, BI	CLOW GROUND	-	. CHEM/PH75, 181.	AIMENT	E. MIONIGI	IT DUMPING
6. OTHER (spraify):		6. OTHER (*pecify):	0	. BIDLOGICAL THE	THENT	3. INCINE!	NOTION
-	i [—]	:		7.	. WASTE OIL DEPRE	CESSIIIG	t. UHDEAG	HOUND INJECTION
			}		SOLVENT RECOVE	RY	S. OTHER	specify):
	İ				. ОТМЕН (просііу):			•
S'Ivent in drume in want acid	costiences a check a check production of the production of the cost of the cos	i gone Fre	neted from a metal ocile (1710.	CE CE	metal olea, in stred in dreating po (45) are str	raiz in a 4 roces	and she	red in 55 places in a stand in a
			V. WASTE RELAT	ED	INFORMATION			
WASTE TYPE	2 LIQUID	. a. s	OLIO4. s	Տեսը	e G E [] 5 . G	A S		
. WASTE CHARACTE	RISTICS							
	•	E 🗍 3. 10	SMITABLE []]4. F	RADI	OACTIVE TS. H	IGHLY V	DLATILE	
	7. REACTIVE	·						
10. OTHER (speed				E.O. 27 &			er eller og som en	w. + 2 @
NASTE CATEGORIA 1, Are proofds of coas		ipeaily itams	such au manifests, ir	nven:	taries, etc. below.			
5001 No.		<i>_</i> _						
1-001, DOG	72, TO	<u>6-7 </u>						
	ant (specify in		sto) of whate by cate	(1.31)	y; mark 'X' to indic	nte which	n waates are p	resent.
▶, SLUBGE	b. CIL	<i>X</i>	Ce. SOLVENTS	-	a. CHEMICAUS		SOLIDS	f. OTHER
MOUNT	/.	^;	_	12	1701 000	AMCULLI	1	AMOUNT
NIT OF MEASUR!	1111 0 MEA		3600	-	/20,000			UNIT OF MEASURE
NIT OF MEASURE	Jana F Gar Majak	SUITE U.	/ 5		Kg	UNIT OF	MEASURE	THE REASONE
(1) PAULT, PIGMEUT:	X : HOILY	ž		×	it Actos	X (1) F %	YASH	YX LIPERATORY HALMACEUT
(2) ME 1 ALS SEUGG: 1	A les	<i>+</i>	128HON-HAR GGRTD SOLVENTS		DIGUERS	121 4.7	MINTON .	12111020117AL
1317:0TW	5-55 ga	L. X	Janoanen garanten		ur caus rics		1.196/ 1.411.1865 	CHRADIDACTIVE
(4) A L UMB (10) \$ T, U D G U	at any	re tuni	what is		(4) PERTICIONS	141 553	HECUS LIG. WASTES	(4) MUNISTPAL
I (8) OTHER (*P*: Hy)			Reabore of to. Me what is me wild per mentit		(5) QYES/INK3	· · · · · · · · · · · · · · · · · · ·	nere unous Lie, was tos III u(specify).	(a) OTHER Reports
					(B) CYANIDE		, , , , ,	
					(7) PHEHOLS			
				_	(a) HALOGENS			
			•		(9) (*C t)			
			: :	-	GOIMP TALS			
				x	Le alone at	4 500	recalled	

Sentinuad From Paga 2		•		
			ED INFORMATI	
3. LIST SUBSTANCES OF GREATES	I CONCERN	WHICH MAY (IL ON THE SITE!	place in Josephing order of hozard). The Red)
Solneuts acids				(1104)
<i>a</i>				
4. ADDITIONAL COMMENTS OR NAP	RATIVE DE	SCRIPTION O	SITUATION KIN	OWN OR REPORTED TO EXIST AT THE SITE.
On June 9+10,1921 X	ebe en	under	I in a gr	without where acid report were
grand water cont	j-	taux . F	DER	not and it the lead as
		VI. HAZ	ARD DESCRIPT	104
A.TYPE OF HAZARD	POTEN- TIAL HAZARD (mark 'X')	C. ALLEGED INCIDENT (mark 'X')	D. DATE OF INCIDENT (mo.,day,yr.)	E. REMARKS
1. 06 HAZA05				
O HUMAN NEALTH		χ	G/9/81	acid raper were emittedformed adming to
a. NON-WORKER				a arme grand and storage le
4. BURKANEKUSERE	<u> </u>	<u> </u>		cel lettery July 10, 801 attac
4. WORKER INJURY				
CONTAM NETICN STOF WATER SUPPLY				
CONTAMBLATION OF FOOD CHANG				
7. CONTAMERATION OF GROUND WATER	χ			
6. CONTAINMATICH 6. OF SUNFACE MATER	X			
DAMAGE TO FLORA/FARRE	,	X	6/9/81	′′
TO, FISH KILL			, ,	
TE CONTAMINATION		X	6/9/8/ 6/10/8/	4
tz. NOTICEAGLE COORS		<u>x</u>	6/9/F1	
13. CONTAMINATION OF SOIL				
14. PHOPEST (DAMAGE			TH manifements in Adversion A. Advantage on a graphy of	
IS. FILE OF EXPLOSION				
TE REMODER / AND IT LESS TAMBURS!		X	6/9/41 G/5/41	
17- BRAIN FRODLUMS				
18. neosian, i kancins				
19. INABEL PARL SECURITY				
ZE, MICEMPY TIMEE HASTES		:		
all supplies to the rea				

3

22. GTHI H 74, early,

		· · · · · · · · · · · · · · · · · · ·				
						A
	Confinued From Front				ORIO	(NA) (00)
•]	·		II. PERMIT INFO	RMATION		NAI
	A. INSICATE ALL APPLICABLE PEF	RMITS HELD BY THE	E SITE.			
	1. NPDES PERMIT 2. SPC	SCPLAN []	3. STATE PERMIT(NPO	/ ₋ .	/ * · · · · · · · · · · · · · · · · · ·
] —			- PACC	13641 PADO 31863	79115-579-017
			6. RCRA TRANSPO	RTER		
	X 7. RCRA STORER B. RC	RA TREATER	9. RCRA DISPOSER	1		
	B. IN COMPLIANCE!					
	I. YES Z. NO		3. UNKNOWN			
	L 1. 1E3 JAI 1. NO	Ų	J. UNKKOWN		7	= 265 (r)(c)
	4. WITH RESPECT TO (list regu	istian nems & number	1: Custo.	ed alm	1 1	# 1
i				ent of worns	grand atorage	z Karka
			AST REGULATO	RY ACTIONS		
	A. NONE Z B. YI	ES (sunimeriza baluw,)			•
			•			•
		IV mroce				
		IA.INSPEC	TION ACTIVITY	(2ast or on-Coine)	•	
	A. HONE SE YE	S (complete Items 1,2	1.3. & 4 belows			
i		2 DATE OF	3 PERFORMED			•
	TATE OF ACTIVITY	FAST ACTION (mo., day, & yr.)	BY: (EPA/State)		4. DESCRIPTION	·
i		0.117/81	(2.2-)() 51210)			·
	See attacked cape	- 2+x	Scillet	RCRA	Inspection - - Water Quali	- Gen + TSD
	See warmen cylin	1990'2		/1 //	- Specion	<u> </u>
	Son lotta de brancis	Otros t	WoterCashite	NPDES	- Water Out	*
į	The continuence	- Freeze		711020	1000 V 4000	'}
			}			
i		X. REM	EDIAL ACTIVITY	(past or on-going)	<u> </u>
	A. NONE Z 9. YE	\$ (cumplete itams 1,	2, 3, & 4 below)			
		2. DATE OF	3. PERFORMED			
	1. TYPE OF ACTIVITY	(mo., day, & ye.)	BY: (EPA/Siate)		4. DESCRIPTION	
	200 0 ((:	See CHERCH	Dolla			
	CRA Confluece	Sheets	MOSTE	GentT	O Complian	e E
i			Bet to Conver	. 0		Cant find
	Ground Water Stedy	May 2, 1950	Murdock	Topsa	1 attched -	Report
1		1. 1.	11:60 14	211.	,	•
]	(pasent Order + Garean	+ 2/10/82	Hir Quality	Attache	<u>u</u>	
1	MOTE Based on the informati	on in Constant III	rationalis V 2011	ana aha Bashi da	A	ie= 11)
١	NOTE: Based on the informati		₹	out the Prelimit	uiry Ausessment (Sect	ion II)
-	information on the first	page of this for	3.			
	EPA Form T2070-2 (10-79)		PAGE 4 OF	٤		





ORIGINAL (Red)

R-585-11-4-16 SITE INSPECTION OF BISHOP TUBE COMPANY PREPARED UNDER

TDD NO. F3-8405-15 EPA NO. PA-568 CONTRACT NO. 68-01-6699

FOR THE

HAZARDOUS SITE CONTROL DIVISION U.S. ENVIRONMENTAL PROTECTION AGENCY

JUNE 25, 1985

NUS CORPORATION SUPERFUND DIVISION

SUBMITTED BY

REVIEWED BY

APPROVED BY

(b) (4)

(b) (4)

ENVIRON. TECHNICIAN

ASSISTANT MANAGER

MANAGER, FIT III

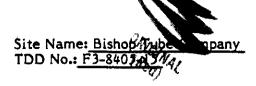


TABLE OF CONTENTS

SECTION	, ORIGINAL (Red)	PAGE
1.0 1.1 1.2 1.3	INTRODUCTION AUTHORIZATION SCOPE OF WORK SUMMARY	1-1 1-1 1-1 1-1
2.0 2.1 2.2 2.3 2.4 2.5 2.6	THE SITE LOCATION SITE LAYOUT OWNERSHIP HISTORY SITE USE HISTORY PERMIT AND REGULATORY ACTION HISTORY REMEDIAL ACTION TO DATE	2-1 2-1 2-1 2-1 2-1 2-2 2-2
3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8	ENVIRONMENTAL SETTING WATER SUPPLY SURFACE WATERS GEOLOGY AND SOILS GROUNDWATERS CLIMATE AND METEOROLOGY LAND USE POPULATION DISTRIBUTION CRITICAL ENVIRONMENTS	3-1 3-1 3-1 3-2 3-3 3-3 3-3 3-3
4.0	WASTE TYPES AND QUANTITIES	4-1
5.0 5.1 5.2 5.2.1 5.2.2 5.3 5.4 5.5	FIELD TRIP REPORT SUMMARY PERSONS CONTACTED PRIOR TO FIELD TRIP AT THE SITE SAMPLE LOG SITE OBSERVATIONS PHOTOGRAPH LOG EPA ASSESSMENT FORM	5-1 5-1 5-1 5-1 5-1 5-2 5-3
6.0 6.1 6.2 6.2.1	LABORATORY DATA SAMPLE DATA SUMMARY QUALITY ASSURANCE REVIEW ORGANIC	6-1 6-1 6-2 6-2
7.0 7.1 7.2 7.3	TOXICOLOGICAL EVALUATION SUMMARY DISTRIBUTION OF CONTAMINANTS TOXICOLOGICAL CONSIDERATIONS	7-1 7-1 7-1



APPENDICES		IGINAL Red)
Α	1.0 COPY OF TDD	A-1
В	1.0 MAPS AND SKETCHES 1.1 SITE LOCATION MAP 1.2 SITE SKETCH 1.3 SAMPLE LOCATION MAP 1.4 PHOTOGRAPH LOCATION MAP	B-1
С	1.0 QUALITY ASSURANCE SUPPORT DOCUMENTATION	C-1
D	1.0 LABORATORY DATA SHEETS	D-1
E	1.0 EPA NOTIFICATION OF HAZARDOUS WASTE SITE FORM	E-1
F	1.0 USDA SOIL SURVEY, CHESTER AND DELAWARE COUNTIES, PENNSYLVA	F-1 NIA
G	1.0 GROUNDWATER BACKGROUND INFORMATION	G-1
н .	1.0 HYDROLOGIC STUDY FOR BISHOP TU COMPANY BY BETZ, CONVERSE, MURDOCK, INC. MAY 2, 1980	IBE H-1



ORIGINAL (Red)

SECTION I

1

Site Name: Bishop Tube Compan TDD No.: F3-8405-15 Reg (Red)

1.0 INTRODUCTION

I.1 Authorization

NUS Corporation performed this work under Environmental Protection Agency Contract No. 68-01-6699. This specific report was prepared in accordance with Technical Directive Document No. F3-8405-15 for the Bishop Tube Company site located in Frazer, Pennsylvania.

1.2 Scope of Work

NUS FIT III was tasked to conduct a site inspection of the subject site. FIT III conducted the site inspection on June 6, 1984.

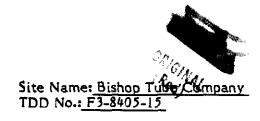
1.3 Summary

A hydrogeologic study of surface water and groundwater conditions at the plant was conducted by Betz, Converse, Murdock, Incorporated in October 1981. The Bishop Tube Company site is located in Frazer, in the southeastern portion of Pennsylvania. In the past, the Bishop Tube Company and the site's former owners have discharged sanitary sewage, cooling water, and acid pickling rinse water into an unlined pit and cesspool that were located on the plant property. Area no. I is an unlined pit which was approximately 200 square feet in size and was filled with lime, and covered by a concrete floor. Area no. 2 is a cesspool which was approximately 160 square feet in size and is now closed; it was filled with limestone and covered with concrete.

A hydrogeologic study of surface water and groundwater conditions at the plant was conducted by Betz, Converse, Murdock, Incorporated. Betz, Converse, Murdock, Incorporated installed 4 monitoring wells at the site as part of this study. During the NUS site inspection on June 6, 1984, these 4 wells were sampled, along with some surface water in the site area. In 1981, the deep groundwater quality at the site was checked by a representative of the United States Geological Survey (U.S.G.S.), who was doing a county-wide study. All concentrations from this analysis were below the Chester County Health Department's standards, according to the Betz, Converse, Murdock Report.



SECTION 2



2.0 THE SITE

ORIGINAL (Red)

2.1 Location

The Bishop Tube Company site is located in the southeastern portion of Pennsylvania, in the borough of Frazer. The site is located off Route 30 and Malin Road, and is surrounded by residential areas.

2.2 Site Layout

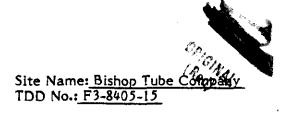
The Bishop Tube Company site is comprised of 2 sites (closed impoundments) situated in a manufacturing plant complex. The sites (area nos. 1 and 2) were once used for the dumping of process waste and sanitary sewage. Area no. 2, which is approximately 160 square feet in size, is located to the west and is directly in front of Plant no. 5. It is filled with lime and covered with concrete. Area no. 1 is located to the west of Plant no. 8, which has been extended in order to cover all of area no. 1 with a concrete floor (see appendix B, figure 2).

2.3 Ownership History

J. Bishop and Company, Platinum Works, opened the site in 1951. The name of the company was changed to Matthey Bishop and Company in 1967. Matthey Bishop sold the plant, as Bishop Tube Company, to the Whittaker Corporation on March 31, 1969. The Whittaker Corporation sold it to Christiana Metals on January 7, 1974. The plant is now called Bishop Tube Company, Division of Christiana Metals Corporation (see appendix D).

2.4 Site Use History

The site was opened in 1951 and was used for the processing of platinum. In 1967, the plant changed ownership and with this change came a switch in the process at the plant. At that time, the purpose of the plant was changed to the manufacturing of special seamless tubing, used for industrial purposes. The plant has been used for this purpose since that time. The present name of the company is Bishop Tube Company, Division of Christiana Metals Corporation.



2.5 Permit and Regulatory Action History

ORIGINAL (Red)

The following table summarizes past inspection activities at the site and permits held for the site:

Date 05/02/80	Activity Consultant Report	Conducted by Betz, Converse, Murdoch, Inc.	Findings PA DER instructed Bishop Tube to conduct a study of groundwater. This study indicated that groundwater flow is in the direction of the tributary of the Little Valley Creek, to the northeast of the site.
06/09/81	Release of Acid Fumes	PA DER	A mixture of nitric acid and hydrofluoric acid was released into the air.
10/25/83	Hazardous Waste Inspection Report	PA DER	Violations were found in both containment and housekeeping practices.
11/29/83	Preliminary Assessment	PA DER	Identification of hazardous materials on site.
06/06/84	Site Inspection	FIT III	Sampling of wells and surface water in the site area.
Permits	5	Number	
NPDES Peri Air Permit RCRA	mit	PA 0013641 15-399-017 PAD081868309	

2.6 Remedial Action To Date

In 1979, the Bishop Tube Company ceased the use of the unlined pit and on-site cesspool for waste disposal. These 2 sites were then packed with limestone and covered with concrete to enclose the impoundments.

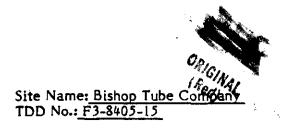


SECTION

)

)

.



3.0 ENVIRONMENTAL SETTING

ORIGINAL (Red)

3.1 Water Supply

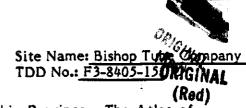
The water supply for the area surrounding the site is provided by 2 sources: the Philadelphia Suburban Water Company and the Malvern Borough Water Authority. The source for the Philadelphia Suburban Water Company supply is the Springton Reservoir located 7 miles to the southeast of the subject site. The reservoir is fed by the Crum Creek. The Malvern Borough System is supplied by 5 springs and 3 wells, according to Ira Dutter, Malvern Public Works foreman. The wells and springs are located off Ruthland Road, 1-1/2 miles to the east of the subject site. The wells are 140, 190, and 196 feet deep, respectively, and produce from the Wissahickon Formation. Also, in the Wissahickon Formation there is at least 1 home well (no. 2917) located 3,000 feet to the southwest of the site. This was the only home well listed in the area by the state well inventory system (see appendix G).

3.2 Surface Waters

The unnamed tributary which is adjacent to the Bishop Tube Company is the upper tributary of the Little Valley Creek. The Little Valley Creek runs to the northeast for 4 miles where it meets with the Valley Creek. The Valley Creek is used for recreational purposes, but not as a drinking water supply. It runs to the northeast for 2-1/2 miles until it reaches the Schuylkill River (see appendix B).

3.3 Geology and Soils

Native soil, according to the Chester and Delaware Counties Soil Survey, is classified as the Manor loam (see appendix F). These loams are derived from the weathering of mica, schist, and gneiss parent materials. However, these soils have been disturbed. In addition, fill material was brought in prior to the plant construction.



The study area is located in the Piedmont Physiographic Province. The Atlas of Preliminary Geologic Quadrangles, 1981 (see appendix G) indicates that rocks in the region have been both faulted and intruded. The Atlas shows the site area to be straddling the contact of the lower Paleozoic-aged Wissahickon and the Ordovician-aged Conestoga Formations. The Conestoga Formation, characterized as a micaceaus limestone, is located beneath the northern section of the property.

The Wissahickon Formation, a schist, underlies the southern site boundary. This is confirmed by well logs from the Betz, Converse, Murdock Consultant's Report on the Bishop Tube Company site (see appendix A). Well no. 1 (see appendix B, figure 2 for well locations), located on the southern boundary of the site, is finished in the Wissahickon schist at a depth of 48 feet. A home well, located approximately 3,000 feet to the southwest of the site, is also located in the Wissahickon schist (see appendix G). Well no. 4 is finished in colluvium, alluvium, or residual soils above the Conestoga Formation at a depth of 20 feet. Well nos. 2 and 3 extend into the Conestoga Formation to depths of 13.5 to 24 feet.

3.4 Groundwaters

On-site well nos. 2, 3, and 4 (see table 1, appendix G) monitor groundwater within the overburden. Well nos. 2 and 3 are in the Conestoga Limestone. Depth to groundwater in these wells ranges from 5 to 10 feet. Several wells and springs used by Malvern Borough, on-site well no. 1, and at least 1 home well are using groundwater from the Wissahickon Formation. Depth to groundwater in these wells is from 6 to 9.5 feet from the surface, based on home well no. 2917 and monitoring well no. 1. Water level elevations in these wells indicate groundwater flow to be northeast toward the unnamed tributary of the Little Valley Creek. Using the groundwater elevations from available wells and the data presented in appendix H, (Betz, Converse, Murdock Consultants Report), it appears that the Wissahickon and Conestoga formations are interconnected in this area.



3.5 Climate and Meterology

ORIGINAL (Red)

(Red)
The average annual temperature of the area is 53°F. The coldest month is generally January with a mean temperature of 30.3°F. The hottest month is July with a mean temperature of 67.4°F. The average annual precipitation is 43.05 inches. The month of highest precipitation is August with 4.30 inches; the lowest is January with 2.74 inches. The average snowfall is 22 inches. The highest snowfall is in February with 7 inches; the lowest in November with .9 inches.

3.6 Land Use

To the east of the Bishop Tube Company is the General Warren Village Housing Development. This development consists of 228 single family homes. To the west is an industrial complex, while to the south and north are residential properties.

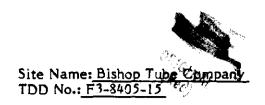
3.7 Population Distribution

There are approximately 228 housing units bordering the Bishop Tube Company site. The total population in these units is approximately 860 persons.

3.8 Critical Environments

There are no critical environments, as defined by the HRS Model, in close proximity to the site. However, Valley Forge National Park is located about 5 miles downstream on Valley Creek.

SECTION 4



4.0 WASTE TYPES AND QUANTITIES

ORIGINAL (Red)

The amount of material disposed of in area no. 1, the unlined pit which was approximately 200 square feet in size, and area no. 2, a sanitary cesspool approximately 160 square feet, is unknown. Known wastes disposed of included cooling water and acid pickling rinse, according to the Betz, Converse, Murdock, Incorporated proposal of work for Bishop Tube Company. Approximately 8,000 gallons of acid waste per year were discharged into an on-site waste stream. In early 1978, the disposals into the cesspool and unlined pit were halted and the discharges were diverted to a sanitary sewer, a nearby stream, and holding tanks (see appendix E).

At present, the site consists of a 4,000-gallon TCE storage tank and five 55-gallon, on-site drums at the Bishop Tube site. The following is a list of wastes that were detected in the groundwater monitoring wells, as well as surface water adjacent to the site:

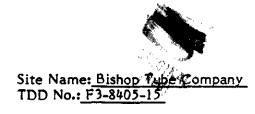
vinyl chloride

1,1,1-trichloroethane
1,1-dichloroethylene
tetrachloroethene
chloroform

trichloroethylene
1,1-dichloroethane
trans-1,2-dichloroethylene
toluene

SECTION 3





.

5.0 FIELD TRIP REPORT

ORIGINAL (Red)

5.1 Summary

On Wednesday, June 6, 1984, FIT III staff members David Walker, James Strickland, Mark Volatile, Richard Gorrell, Barry Schlesinger, and Thomas Fromm visited the Bishop Tube Company site in Frazer, Pennsylvania. The purpose of the visit was to conduct a site inspection. The team was on site from 11:15 AM to 1:50 PM. The weather at the time of the inspection was sunny, with temperatures in the mid-80s.

5.2 Persons Contacted

5.2.1 Prior to Field Trip

Meirs Johnson Project Manager Bishop Tube Company Frazer, PA 19355 (215) 647-3450

Frank Holmes
PA DER
1875 New Hope Street
Norristown, PA 19401
(215) 270-1920

5.2.2 At The Site

Meirs Johnson Project Manager Bishop Tube Company Frazer, PA 19355 (215) 647-3450

5.3 SAMPLE LOG

Site Name Bishop Tube Company

Tr Organic	RAFFIC REPO	RTS Hìgh Hazard	SAMPLING LOCATION	PHASE	SAMPLE DESCRIPTION	OATE	ЗМІТ	pH	COMMENTS/OBSERVATIONS	LABORATORY
7083			Montering Well #1	Aq	Monitering Well #1	6/6/84	12:30	5.93		
7084					Monitering Well #2				When First Uncapped	
7085	· .		Monitoring Well #3		Monitaring Well #3		1			
7086			Monitoring Well 4		Monitering Well 4					
4490			Upstream		Upsircan	6/6/84	13.08	7.38		
7087			Dawn stream	_	Downs tream	6/6/84	13.35	7.60		
4491			1		Tributary From Site		1	8		
4492			Swale Along Ruilmol		Swale along Ruilroad			1		
4493			Blank		· ·	6/6/84				
	l			L	·		_			
		_								
	-									
									(R	
									Š	
								Ì		

Site Name: Bishop Tube Company
TDD No.: F3-8405-15

5.4 Site Observations

ngiginal.

- o The confluence of the swale along the railroad and the tributary revealed that there was more discoloration of the water on the swale side.
- There were lawn mowers and other debris on the side of the tributary.
- o Downstream from the site, approximately 100 yards, there was a small business pumping water from the tributary.
- o When well no. 2 was initially uncapped, solvent odors were noticed and a reading of 6 ppm was recorded on the HNU.



Photo 1 - Monitoring well no. 1 - samplers are Thomas—Fromm and Mark Volatile.

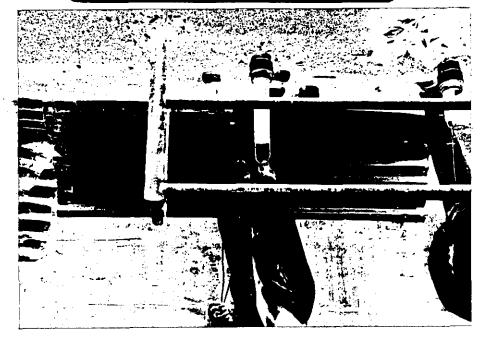


Photo 2 - Monitoring well no. 2 - sampler is James Strickland.

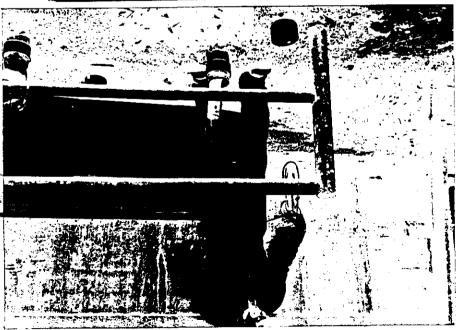


Photo 3 - Monitoring well no. 3 - sampler is Richard Gorrell.

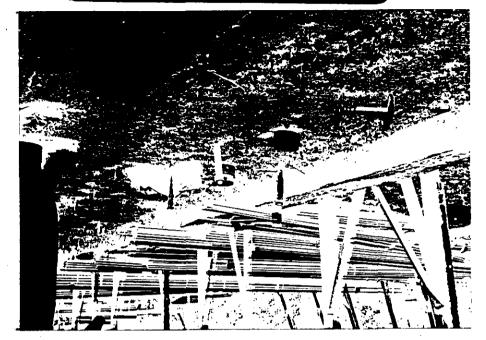


Photo 4 - ___Monitoring well no. 4 - sampler is Thomas___Fromm.



Photo 5 -Upstream Little Valley Creek - sampler is Thomas Fromm.



Photo 6 -Tributary from the site - sampler is Thomas Fromm.



Photo 7 Building on top of old impoundment.



- Photo 8 -- Downstream on the Little Valley Creek -- sampler is Thomas Fromm.



Photo 9 -Downstream sample of swale along railtoad sampler is Thomas Fromm.

						1 1 1 2 2 2	-74/15-15	
\$EPA		TENTIAL HAZAF SITE INSPECT	TION F	EPORT	. A TION!		PICETION 02 SITE NUMBER 568	
U 6175 MARKE AND 1 00		E LOCATION AND	U (MSP)	ECTION INFORM	IATION			
II. SITE NAME AND LOC IT SITE NAME (Legar dominon c			02 STA	ET, NOUTE NO. OR S	PECIFIC LOCATION	DENTIFIER		
Bishop Tube C	ompany		Ro	ute 30 and M	falin Road			
D3 CITY		 	1	E 05 ZIP CODE	DE COUNTY		07COUNT	28 CO11
Frazer			PA	19355	Chester			
32 30 26"	47 CLOWSEPHOR 88".	10 TYPE OF OWNERS: \$\times A. PRIVATE \$\times F. OTHER.			C STATE	O COUNT		AL
H. INSPECTION INFORI	MATION 02 SITE STATUS	1 03 YEARS OF OPERA	TXON					
06, 06, 84	C ACTIVE	860	1951	1 1978 EAR ENDING YEAR		JNKNOWN	1	
N AGENCY PERFORMING ING			~ .					
C E. STATE C F. STATE	E CONTRACTOR			NUNICIPAL II D. N ITHER	NUNICIPAL CONTR	ACTOR	Name of Len.	
.)		OB TITUE			G7 ORGANIZA	TION	OR TELEPHON	E NO
		Environm	ental	Technician	NUSC	orp.	215 68	7-951
		10 TITLE			11 ORGANIZA		12 TELEPHON	ENO
		Geologist	<u> </u>		NUSC	orp.	215 68	7-951
		Environm	ental	Engineer	NUSC	orp.	1 215 68	7-951
		Environm	ental	Technician.	NUSC	orp.	1 215 68	7-951
		Environm	ental	Technician	NUS C	orp.	1215 68	7-951
		Environm	ental	Engineer	NUSC	orp.	1215 68	
		Environ. Technicia	ın _	NUS Corpor			16 TELEPHON (215) 687	
		Project En	1g.	Bishop Tub Route 30 a	e Company nd Malin	Road	(215) 64	7-3450
							()	
							()	
							()	
							()	
		1						
7 ACCESS GAINED BY	18 TIME OF INSPECTION	I D WEATHER COND	OFFICINE					
₩ PERMISSION	11:15 to 13:50	Sunny, ho	t, and	d humid				
V. INFORMATION AVAI	LABLE FROM	Lon Od					D3 TELEPHONE	
D1 CONTACT		03 Ot whenholen					US IELEPTIONE!	~

HOITASHADRO BO

fit iii

NUS Corp.

OF YELEPHONE NO.

215-687-9510

06 ,06,84

Doug Hill
04 PERSON RESPONSALE FOR SITE INSPECTION FORM

EFA FORM 2070-13 (7-81)

POTENTIAL HAZARDOUS WASTE SITE

SE	PA		SITE INSPECTION REPORT PART 2 - WASTE INFORMATION			PA	568
II. WASTES	ITATES, QUANTITIES, AN	D CHARACTER	STICS				
O1 PHYSICAL S	STATES CARCA MINN MANY ER FINES XF LIQUID E G GAS	02 WASTE QUANTI	ITY AT SITE If weere quantifies Independent	OB WASTE CHARACT XA TOXIC B COMMO C RADIO D PERSIS	ACTIVE _ G FLAMM	BLE XI HIGHLY TIQUS JEPLOS MABLE K REACTI	SIVE IVE
. D OTHER	(Specity.	NO OF DRUMS				·	
III. WASTE T	YPE						
CATEGORY	SUBSTANCE NA	AME	01 GROSS AMOUNT	D2 UNIT OF MEASURE	03 COMMENTS		
SLU	SLUDGE						
OLW	OILY WASTE						
SOL	SOLVENTS		16.5	Tons	Generated	per month	
PSD	PESTICIDES						
occ	OTHER ORGANIC CH	IEMICALS	1				
IOC	INORGANIC CHEMIC	ALS					
ACD	ACIOS						
DAS	BASES						
MES	HEAVY METALS						
IV. HAZARD	OUS SUBSTANCES See AM					·	
O1 CATEGORY	OZ SUBSTANCE NA	ME	03 CAS NUMBER	04 STORAGE DIS	POSAL METHOD	OS CONCENTRATION	CONCENTRATES
sol	vinyl chloride -		75-01-4		d unlined pit		
sol	trichloroethylen		79-01-6		d unlined pit		<u> </u>
sol	1,1,1-trichloroet		71-55-6		d unlined pit	7,700	
sol	1,1-dichloroethe		107-06-2		d unlined pit	54	
sol	1,1-dichloroethy		75-35-4		d unlined pit	690	
sol	trans 1,2-dichlor	-	156-60-5	I -	d unlined pit	2,700	
sol	tetrachloroethen	ie	127-18-4		d unlined pit	160	
sol	toluene		108-88-3		d unlined pit		
sol	chloroform		67-66-3	cesspool an	d unlined pit	5k	
		,	L!				
				<u> </u>			<u> </u>
						· · · · · · · · · · · · · · · · · · ·	
V. FEEDSTO	ICKS / See Aspendix Ar CAS Million	*81					
CATEGORY	01 FEE0870CK	MAME	02 CAS NUMBER	CATEGORY	O1 PEEDSTO	CK NAME	02 CAS NUMBER
FOS				FDS			
FDS				FDS			
FDS				FDS			
FDS				FDS			
VI. SOURCE	E OF INFORMATION .Co. 12	DECME INDIANCES + 9	State fres sample enerytis N	ep2115)			

FIT III data summay sheet from site inspection of June 6, 1984. Also, Pennsylvania Department of Environmental Resources (PA DER) preliminary assessment done by Frank Holmes.

SEPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

	I. IDENT	FIFICATION
ļ	OI STATE	02 SITE NUMBER 568

PART 3 - DESCRIPTION OF H	AZARDOUS CONDITIONS AND INCIDENT	s ···	
II. HAZARDOUS CONDITIONS AND INCIDENTS			
01 St A. GROUNDWATER CONTAMINATION 03 POPULATION POTENTIALLY AFFECTED: 3,000	02 X OBSERVED (DATE: 6-6-84) 04 NARRATIVE DESCRIPTION	☐ POTENTIAL	☐ ALLEGED
There were 2 sites used for the dumpin other was an unlined pit. On-site wells		e cesspool an	d the
01X B. SURFACE WATER CONTAMINATION 03 POPULATION POTENTIALLY AFFECTED: <u>Unknown</u>	02 TOBSERVED (DATE: 6-6-84) 04 NARRATIVE DESCRIPTION	G POTENTIAL	T ALLEGED
The site is located adjacent to a tribu Valley River. The Valley River is used the railroad tracks. The swale is a trib	for fishing. Contamination was	s found in a s	
01 C. CONTAMINATION OF AIR 03 POPULATION POTENTIALLY AFFECTED:	02 CI OBSERVED (DATE) 04 NARRATIVE DESCRIPTION	☐ POTENTIAL	□ ALLEGED
N/A			
01 D. FRE/EXPLOSIVE CONDITIONS 03 POPULATION POTENTIALLY AFFECTED:	02 TOBSERVED (DATE:) 04 NARRATIVE DESCRIPTION	E POTENTIAL	2 ALLEGED
N/A			
01 C E. DIRECT CONTACT 03 POPULATION POTENTIALLY AFFECTED:	02 C OBSERVED (DATE) 04 NARRATIVE DESCRIPTION	☐ POTENTIAL	I ALLEGED
N/A			
01 2 F. CONTAMINATION OF SOIL 03 AREA POTENTIALLY AFFECTED: 60 feet	02 ☐ OSSERVED (DATE) 04 NARRATIVE DESCRIPTION	POTENTIAL	C ALLEGED
The area of soil contamination at the s of Hazardous Waste Sites report submit		g to the Noti	fication
01 G. DRINKING WATER CONTAMINATION 3,000	02 □ OBSERVED (DATE:) 04 NARRATIVE DESCRIPTION	X POTENTIAL	C ALLEGED
The borough of Malvern is presently us municipal source. These wells are loca 3,000 feet to the southwest of the site,	ted east of the site. One dome:	stic source, l	
01 H. WORKER EUFOBURE/NLURY 03 WORKERS POTENTIALLY AFFECTED:	02 GOBERVED (DATE:) 04 NARRATIVE DESCRIPTION	☐ POTENTIAL	C ALLEGED
N/A			
01 DI. POPULATION EXPOSURE/INJURY 03 POPULATION POTENTIALLY AFFECTED:	02 OBSERVED (DATE:) 04 NARRATIVE DESCRIPTION	POTENTIAL	C ALLEGED
N/A			

2FPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

L IDENTIFICATION

PART 3 - DESCRIPTION OF HA	ZARDOUS CONDITIONS AND INCIDENT	B LPAI	26857 . (C
IL HAZARDOUS CONDITIONS AND INCIDENTS (Common)	·		
01 DJ. DAMAGE TO FLORA 04 NARRATIVE DESCRIPTION	02 OBSERVED (DATE:)	☐ POTENTIAL	□ ALLEGED
N/A			
01 K. DAMAGE TO FAUNA 04 NARRATIVE DESCRIPTION (Meader name(3) of Research)	02 OBSERVED (DATE)	POTENTIAL	C ALLEGED
N/A		•	
01 CONTAMINATION OF FOOD CHAIN 04 NAMEATIVE DESCRIPTION	02 3 OBSERVED (DATE:)	D POTENTIAL	ALLEGED
N/A			
01 (XM. UNSTABLE CONTAINMENT OF WASTES	02 OBSERVED (DATE:)	XPOTENTIAL.	ALLEGED
Waste was discharged into the cesspool	o4 NARRATIVE DESCRIPTION area and the unlined pit from	1951 until 19	78.
01 C N. DAMAGE TO OFFSITE PROPERTY 04 NARRATIVE DESCRIPTION	02 OBSERVED (DATE:)	- POTENTIAL	C ALLEGED
N/A			
01 C O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs 04 NARRATIVE DESCRIPTION	02 G OBSERVED (DATE)	☐ POTENTIAL	Z ALLEGED
N/A			
01 C P. ILLEGAL/UNAUTHORIZED DUMPING 04 NARRATIVE DESCRIPTION	02 G OBSERVED (DATE:)	□ POTENTIAL	C ALLEGED
N/A			
OS DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEG	NED HAZAROS		
N/A			
III. TOTAL POPULATION POTENTIALLY AFFECTED: 12.	703		
IV. COMMENTS			
V. SOURCES OF INFORMATION (Createsting priority case, 8-3), India load in	artigue anerysus. 1980/15		
Laboratory data from NUS FIT III site i	nspection of June 6, 1984 and	from EPA file	es.

ORIGINAL (Red)

Ti	DENTIFICA	
0	STAND 02 SIT	E L
L	PANY/A	568
	En 7/	

⊕EPA	PART 4 - PERMIT		PANTA 568			
IL PERMIT INFORMATION						
01 TYPE OF PERMIT ISSUED	02 PERMIT NUMBER	03 DATE	COURD	04 EXPIRATION DATE	05 COMMENTS	
XI A. NPOES	DA 0010041					
☐ B. UIC	PA 0013641	1				
CXC. AM	15 220 017	 				
ZO NCRA	15-339-017 PA 008186630	<u>.</u>				
☐ E. RCRA INTERIM STATUS	LY ANGTORDA	}				
☐ F. SPCC PLAN		+				
G. STATE (Second)		+				
H. LOCAL (Second)						
		 -		<u> </u>		
☐ I. OTHER (Second)						
J. NONE						
M. SITE DESCRIPTION 01 STORAGE/DISPOSAL (Choose of that specing						1
		FMEABURE		MEATRAIENT /Choose of store	(0')	OS OTHER
EXA. SURFACE IMPOUNDMENT	8.25 tons	s/monti	1 – ~	INCENERATION		X A. BUILDINGS ON SITE
B. PLES				UNDERGROUND INJ		
C. DRUMS, ABOVE GROUND				CHEMICAL/PHYSICA	L	6
D. TANK, ABOVE GROUND B. TANK, BELOW GROUND		_	1 -	BIOLOGICAL		OS AREA OF SITE
F. LANDFILL			·	WASTE OIL PROCES		OG AREA OF SITE
□ G. LANDFAIN			_	SOLVENT RECOVERS OTHER RECYCLINGS	•	7 (4070)
☐ H. OPEN DUMP				OTHER	, according	
SI OTHER CESSDOOL	8.25 tons/	month	"	(See	edy)	
Bishop Tube Company us that included sanitary se	sed an unlined pit a swage, cooling was	and ces ter, and	sspoc d aci	l area to disp d pickling rin	oose of pla se water.	nt waste
IV. CONTAINMENT	· · · · · · · · · · · · · · · · · · ·					
01 CONTARMENT OF WASTES (Cross one)						
A. ADEQUATE. SECURE	☐ B. MODERATE	□ C. #	(ADEQL	IATE, POOR	D. INSECUP	IE, UNSOUND, DANGEROUS
oz description of drums, dikina, Liners. Waste material was plac	•	it and o	cessp	ool with no l	iners.	
V. ACCESSIBILITY 01 WASTE EARLY ACCESSIBLE. YE 02 COMMENTS	s & NO					
Presently, the unlined pi		covere	ed wi	th concrete (and packed	with limestone.
VI. SOURCES OF INFORMATION /Care	deside referènces. D. g. state files. Asmer	3 avertens, repr	urie)			··· —
State PA and information	n from EPA file.		,			

≗FPΔ

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT



	PART 5-WATER	, DEMOGRAPHI	ic, and envir	DNM	ENTAL DATA	<u></u>	· 10 /00
II. DRINKING WATER SUPPLY							
O1 TYPE OF DRINKING SUPPLY		02 STATUS	unknov	m		۰	S DISTANCE TO SITE
SURFACE	WELL	ENDANGER	O AFFECTED		MONITORED		
COMMUNITY A.30	D. 💢	A. 🗆	●. □		C. 🗆		<u>1-1/2(mi)</u>
NON-COMMUNITY C. D	o. r‱	0. 🗆	E. O		f. 0		3,000 feetmi)
M. GROUNDWATER							
01 GROUNDWATER USE IN VICINITY (Cross)	470)						
M.A. CHLY SOURCE FOR DRINKING		NY DUSTRIAL, INVIGATION M ANDRING	(London) and	CIAL.	BIOLIETVIAL, SVINGAT	ПОН	D NOT USED, UNUSEABLE
02 POPULATION SERVED BY GROUND WA	3,000	-	03 DISTANCE TO N	ENNES	T ORRIKING WATER	MELL	3,000(mi)
04 DEPTH TO GROUNDWATER	OS DIRECTION OF GRO	NOWATER FLOW	OF CONCERN	FER	OF POTENTIAL YIEL	٥	OB SOLE SOURCE AQUIFER
5 to 10 m	north-nort	heast	5 to 10	164	O ALGER) and the	□ YES □ NO
OS DESCRIPTION OF WELLS measure uneago						_{gpd}	<u></u>
The wells that supply		lalvern are l	ocated appi	oxi	mately 1-1/	2 mi	iles
southeast of the site.							
of the site.					,		
10 RECHARGE AREA			11 DISCHARGE ARE		<i>C</i>		
U YES COMMENTS							flows toward the the Little Valley
□NO				II WIII	led tributar	y OI	the Little valley
IV. SURFACE WATER				•			
01 SURFACE WATER USE (Check one)							<u> </u>
A RESERVOIR, RECREATION DRINKING WATER SOURCE		N, ECONOMICALLY IT RESOURCES	C. COMM	ERCIA	L. INDUSTRIAL	0	D. NOT CURRENTLY USED
02 APPECTED/POTENTIALLY APPECTED BO	DOIES OF WATER						
NAME:					AFFECTED		DISTANCE TO SITE
Tributary to Little	Valley River						150 feet (mi)
						_	(mi)
						_	(mi)
V. DEMOGRAPHIC AND PROPERT	Y INFORMATION						······································
01 TOTAL POPULATION WITHIN				021	DISTANCE TO NEARE	ST POP	ULATION
ONE (1) MILE OF SITE TV	(O (2) MILES OF SITE	THREE /3) MILES OF SITE	1			1
	9.829	c1.	2,703		_50	0 fe	<u>≥† (mi)</u>
NO OF PERSONS	NÓ OF PERSONS		D OF PERSONS				
03 NUMBER OF BUILDINGS WITHIN TWO (2)			U4 DISTANCE TO N	AND	TOPP-BITE BUILDING		1
3,393					250_fee	<u> </u>	mi)
08 POPULATION WITHIN VICINITY OF SITE (Provide Agreemy Statements of			Auge. di			
The population on all		te is urban,	but become	s m	ore rural as	one	moves
further away from the	e site.						•



\$EPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

I. IDENTIFICATION

OLSTATE OF SITE NUMBER

568

	PART	5 - WATER, DEMOGRAPH	IC, AND ENVIRO	NMENTAL DA	TA PA	568	
VI. ENVIRONMENTAL INFORMA	TION						-
OI PERMEABILITY OF UNBATURATED Z	ONE (Cheen en	• •					_
□ A. 10-4 - 10-	TO P CRIVERC (A) B. 10-4 - 10-9 CRIVERC C. 10-4 - 10-3 CRIVERC D. GREATER THAN 10-3 CRIVERC SERVEABLE (A) B. RELATIVELY IMPERIMEABLE C. RELATIVELY PERIMEABLE D. VERY PERIMEABLE O4 DEPTH OF CONTAMINATED SOR, ZONE O5 SOIL PH O7 ONE YEAR 24 HOUR RAINFALL OB SLOPE SITE SLOPE SITE SLOPE STE SLOPE O7 ONE YEAR 24 HOUR RAINFALL OB SLOPE SITE SLOPE TERRAIN AVERAGE SLOPE SITE SLOPE DIRECTION OF SITE SLOPE TERRAIN AVERAGE SLOPE 5 to 7						
02 PERMEABILITY OF BEDROCK/Creek	eriti)	PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA N					
A. IMPERA	AEABLE 10 ⁻⁶ onvade)	8. RELATIVELY IMPERMEAS	LE C. RELATIVE	LY PERMEABLE	D. VERY (F	ERMEABLE on 10 ⁻² c/R sec)	
03 DEPTH TO BEDROCK	04 DEPTH C	F CONTAMNATED SOIL ZONE	05 SOL p				
6(n)	}	6	_N/	'A			
DE NET PRECIPITATION	07 ONE YEA	A 24 HOUR RAINFALL	GE SLOPE				_
34(in)	<u> </u>	2.5 to 3(in)	1 7	DIRECTION OF	SITE SLOPE	5 to 7	
00 FLOOD POTENTIAL		l '	, 				_
SITE IS IN N/A YEAR FLO	ODPLAIN	N/A - SITE IS ON BANK	ER ISLAND, CQASTA	L HIGH HAZARD	area, riverii	NE FLOGOWAY	
I I DISTANCE TO WETLANDS IS NOT THE			12 DISTANCE TO CALL	TCAL HABITAT for on	dengared (Addens)		
ESTUARINE		OTHER			N/A	(m)	
A. N/A (mi)	9	N/A (mi)	ENDANGER	ED SPECIES:	N/A	<u> </u>	
3 LAND USE IN VICINITY							_
DISTANCE TO:							
COMMERCIAL/INDUSTR	TAL	RESIDENTIAL AREAS: NATIO FORESTS; OR WILDLIF	NAL/STATE PARKS. E RESERVES	PRIME A			
A3/4 (mi)		<u> 500 feet</u>	(mi)	c. N/A	(mi)	D. N/A (mi)	
14 DESCRIPTION OF SITE IN RELATION 1	TO SURROUN	DING TOPOGRAPHY					_
The site is located a	at the b	ase of a ridge with a	a steep slope	behind the	e comple:	x	
			` -		•		

VII. SOURCES OF INFORMATION (Consequent references, e.g., state figs. springs analysis, reports

USGS Malvern and Valley Forge, Pennsylvania Quadrangle, 7.5 Minute series

Report on Bishop Tube Company by Betz Converse Murdoch, Inc.

&EPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 4 - SAMPLE AND FIELD INFORMATION

L IDENTIFICATION

01 STATE D2 SITE NUMBER

PA 568

IL SAMPLES TA	AWSW		MI TO SHAFEE AND PRELO INTORNALION	
		OI NUMBER OF SAMPLES TAKEN	OZ SAMPLES SENT TO	OJ ESTIMATED DATE
SAMPLE TYPE	<u> </u>	SAMPLES TAKEN		MESILTS AVAILAB
GROUNDWAT		4	Environmental Research Group	
SUPPACE WAT	TER	4	Environmental Research Group	
WASTE			117 North First Street	
MR			Ann Arbor, Michigan 48104	
PUNOFF				
8PILL.	-			
SOL				
VEGETATION				
отнея В	lank	1	Environmental Research Group	
III. FIELD MEAS	UREMENTS TA			
OI TYPE		02 COMMENTS		
HNU phot	coionizer	No reading	s above background were detected, except at m	onitoring
	<u>"</u>	well no. 2	where a reading of 6 ppm was recorded when t	
		Cap was i	nitially removed.	
		l		
			,	
		}		
IV. PHOTOGRA	PHS AND MAP		· · · · · · · · · · · · · · · · · · ·	
DI TYPE OCOMO	DAMPIAL DAIL		02 IN QUETODY OF NUS Corporation	
03 MAPS	04 LOCATION			_
X□ yes □ No		USGS Malvern	, Pennsylvania Quadrangle map, 7.5 minute seri	es
V. OTHER FIELD	DATA COLLE	CTED (Provide name) and	rishon!	
N/A				
			·	
VI. SOURCES O	FINFORMATIO	N (Can appendix references +)	seule Mes. serfelle enseyers. reports)	
FIT III site	e inspectio	n of June 6, 1	984	
				
PA FORM 2070-13	(7-01)			

\$EPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 7 - OWNER INFORMATION

I. IDENTIFICATION
OF STATE TO
N. CURRENT OWNER(S)			PARENT COMPANY (2 approach)			
DI NAME		02 D+8 NUMBER	OS NAME		09 D+8 NUMBER	
Bishop Tube Company	7		Christiana Metals		}	
		04 SIC COOR	10 STREET ACCRESS (P.O. dos. RFD P. onc.)		11 SIC CODE	
Route 30 and Malin R	load	3498	Route 30 and Malin R	load	İ	
DE CITY	OS STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE	
Frazer	PA	19355	PO Box 1189 Frazer	PA	19355	
O1 NAME		02 D+8 NUMBER	OB NAME		09 D+8 NUMBER	
N/A			N/A		ţ	
03 STREET ADDRESS (P. O. Box., RFD P. ont.)		04 SIC CODE	10 STREET ADDRESS (P.O. Box, MFD P. ont.)		11 SIC CODE	
					1	
08 CITY	OS STATE	07 ZP CODE	12 GTY	13 STATE	14 ZIP CODE	
	ļ,					
01 NAME		02 D+8 NUMBER	OS NAME		09 D+8 NUMBER	
N/A		1	N/A			
D3 STREET ADDRESS (F O. Son, RFD o. ole.)	···	04 SIC CODE	10 STREET ADDRESS (P.O. Ses. MO F. orc.)		113IC CODE	
					1	
05 CITY	OS STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE	
OT NAME		02 Q+ E NUMBER	OS NAME		QQ D+B NUMBER	
N/A				N/A		
03 STREET ADDRESS (P.O. BAL MFD F. ME.)		TO4 SIC CODE	10 STREET ADDRESS (P.O. Bur. M/D e. enc.)	In tisic cope		
					1100000	
05 CITY	I CO STATE	07 ZIP CODE	12 C/TY	112 6744	14 ZIP CODE	
	[V-31/7]	U/ ZIF CODE	12017	ISSIAIE	14211 CODE	
III. PREVIOUS OWNER(S) (Let mest re	ten Mall	CZ D+B NUMBER	IV. REALTY OWNER(S) IN approach as IN	ege recont firet:	02 D+8 NUMBER	
Whittaker Corporation	_	CZ D+B NUMBER			IO2 DY BROMBER	
OS STREET ADDRESS (P.O. Bus. AFD P. ME.)		1 04 SIC COOR	N/A		04 SIC CODE	
Unknown			US STREET ADDRESS (P.O. Son. APOV. Sec.)		O4 3C CODE	
DI CITY	IOS STATE!	07 ZIP CODE	OS CITY	LOS STATE	07 ZIP CODE	
					0 00_	
21 NAME		02 0+0 NUMBER	O1 NAME		02 D+ B NUMBER	
N/A			N/A			
03 STREET ADDRESS (P.O. Box. MFD F. etc.)	<u></u>	04 SIC CODE	O3 STREET ACCRESS (P.O. Box. AFD 4. onc.)		04 SIC CODE	
96 CITY	OS STATE	07 ZIP CODE	OS CITY	OS STATE	07 ZIP CODE	
	1 1		į			
DI NAME		02 D+8 NUMBER	OI NAME		02 D+8 NUMBER	
N/A	1		N/A			
DO STREET ADDRESS (P.O. Son. MO.P., on.)		04 SIC CODE	O3 STREET ADDRESS (P.O. Box, AFO P. occ.)		04 SIC CODE	
DECITY	06 STATE	07 ZIP CODE	OS CITY	QO STATE!	07 ZIP CODE	

EPA files and NUS FIT III site inspection of June 6, 1984



⊕EPA			SITE INSPI	ARDOUS WASTE SITE	L IDENTIFICATION					
ALLY			PART 8 - OPER	ATOR INFORMATION	L_PA_L	568				
IL CURRENT OPERAT	OR Provide California from			OPERATOR'S PARENT COMPANY (# assessio)						
Bishop Tube C	ompany		02 D+ë MIMBËR	N/A		11 D+8 NUMBEA				
Route 30 and	Malin Road		04 SIC COOL	12 STREET ADDRESS (P.O. am. APO P. osc.)		13 SIC CODE				
OS CITY		OF STATE	OF ZIP CODE	14 CITY	15 STATE	16 ZIP CODE				
Frazer		PA	19355							
OB YEARS OF OPERATION	DO MAME OF CHINER									
III. PREVIOUS OPERAT	OR(2) (Let next report 0		ry d'allerant fram genege)	PREVIOUS OPERATORS' PAREN	T COMPANIES (raturaturi				
OT NAME			OZ D+B NUMBER	TONAME		11 D+ B NUMBER				
Bishop Tube C	ompany			N/A		 				
03 STREET ADDRESS (P.O. a.	m, AFD a, etc.)		04 SIC COOE	12 STREET ADDRESS (P.O. Bus, NºO F. etc.)		13 SIC CODE				
Route 30 and	Malin Road									
06 CITY		1	07 ZIP CODE	14 CHY	15 STATE	16-ZIP CODE				
Frazer		PA	19355							
1974 to 1979	OF NAME OF OWNER	DURING THE	PEMOO							
D1 NAME	<u> </u>		02 D+8 NUMBER	10 NAME		11 D+B NUMBER				
Whittaker Corporation				N/A		ļ				
O3 STREET ADDRESS (P.O. Box, RFD 4, oc.)			04 SIC CODE	12 STPRET ADDRESS (P.O. Box, AFD P. etc.)		13 SIC CODE				
Unknown			_			1				
OS CITY		OS STATE	07 ZIP CODE	14 СПУ	15 STATE	16 ZIP CODE				
1969 to 1974	OS NAME OF OWNER	DURING THE	S PENOD							
O1 NAME	<u></u>		02 D+ B NUMBER	10 NAME		11 D+8 NUMBER				
		ļ	Of DA B HOWER	N/A		II UTS NUMBER				
Matthey Bisho			04 BIC CODE	12 STREET ACCRESS (P.O. Sax, APO F, arc.)		13 SIC CODE				
OS CITY	i	OS STATE	07 ZIP CODE	14 City	15 STATE	16 ZIP CODE				
OR YEARS OF OPERATION	DO NAME OF OWNER	THE DIMPLE	PERIOD			L				
1951 to 1967										
IV. SOURCES OF INFO	RMATION (Co. speeds	/0/a/a/1700. 0	e., seed the, surply area,	et. reptty						
		•	S - 41 -							
EPA file infor	mation and s	tate in	ilormation							

ed)

				- C - C		
⊕EPA	P	OTENTIAL HAZ	O1 STATE 02 S	1. IDENTIFICATION 01 STATE 02 SITE NUMBER		
ACIA	PART 9	—	RANSPORTER INFORMATION	PA	568	
II. ON-SITE GENERATOR						
OT NAME	(02 D+8 NUMBER				
Bishop Tube Compar	ıy		}			
DE STREET ADDRESS (P. O. Box, APD 4, or	K.)	04 SIC CODE				
Route 30 and Malin	Road					
06 CITY	00 STATE	07 ZIP CODE	- 1			
Frazer	PA	19355				
III. OFF-SITE GENERATOR(S)				· · · · · · · · · · · · · · · · · · ·		
01 NAME		02 D+8 NUMBER	01 NAME	O	D+8 NUMBER	
N/A			N/A			
03 STREET ADDRESS (P.O. Sax, RPD #, or	e.j	04 SIC CODE	O3 STREET ADDRESS (P O Box, AFD P. otc.	ı	04 SIC CODE	
OS CITY	OS STATE	O7 ZIP CODE	OSCITY	OG STATE O	ZEP COOE	
D1 NAME		22 D+8 NUMBER	O1 NAME	0:	D+8 NUMBER	
N/A	Ĭ		N/A	i ·		
DS STREET ADDRESS (P. C. Box, AFD F. oc	F.)	04 SIC CODE	03 STREET ADDRESS (P.O. Sec. AFD #, ore	,	04 SIC CODE	
OS CITY	OS STATE	O7 ZIP CODE	os city	OR STATE OF	ZIP CODE	
IV. TRANSPORTER(S)	<u> </u>	-		<u> </u>		
O1 NAME	[4	D2 D+8 NUMBER	01 NAME	O	D+8 NUMBER	
N/A			N/A			
3 STREET ADDRESS (P.O. Box. AFO F. ST	c.)	04 SIG CODE	03 STREET ADDRESS (# 0. 804, RFD = etc		04 SIC CODE	
DS CITY	OS STATE	O7 ZIP CODE	OS CITY	OS STATE O	ZIP CODE	
DI NAME		2 D+8 NUMBER	01 NAME	1 03	D+8 NUMBER	
N/A			N/A	ľ		
D3 STREET ADDRESS (P.O. Box. AFG 4. on		04 SIC CODE	03 STREET ADDRESS (P.O. Bost, AFD F. ecc.	,	04 SIC CODE	
DS CITY	OB STATE	07 ZIP CODE	05 CITY	OG STATE OF	ZP CODE	

State and EPA file information

V. SOURCES OF INFORMATION (Can appelle information, e.g., same first, sample or

			4/ 1
&EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 10 - PAST RESPONSE ACTIVITIES		C. IDENTIFICATION O1 STATE O2 SITE NUMBER PA 568
IL PAST RESPONSE ACTIVITIES			
01 D A. WATER SUPPLY CLOSED	OZ DATE	03 AGENCY	
N/A			
01 D B. TEMPORARY WATER SUPPLY PROVI 04 DESCRIPTION N/A	DED 02 DATE	03 AGENCY	
01 C. PERMANENT WATER SUPPLY PROVI 04 DESCRIPTION	DED 02 DATE	03 AGENCY	
N/A	02 DATE	1	<u> </u>
01 D. SPILLED MATERIAL REMOVED 04 DESCRIPTION	UZ DATE	O3 AGENCY	
N/A 01 D E. CONTAMINATED SOL REMOVED	02 DATE	03 AGENCY	
04 DESCRIPTION			
N/A 01 D F. WASTE REPACKAGED	02 DATE	03 AGENCY	
04 DESCRIPTION N/A			
01 G. WASTE DISPOSED ELSEWHERE 04 DESCRIPTION	OZ DATE	03 AGENCY	
N/A			
01 OCH, ON SITE BURIAL 04 DESCRIPTION	02 DATE <u>late 1979 or</u> early 1980		
Material was packed with lime	and placed under a cement cap.		
01 DI. IN SITU CHEMICAL TREATMENT 04 DESCRIPTION	02 DATE	03 AGENCY	
N/A	OZ DATE		
01 D J. IN SITU BIOLOGICAL TREATMENT 04 DESCRIPTION N/A	02 DATE	03 AGENCY	
01 CLK. IN SITU PHYSICAL TREATMENT 04 DESCRIPTION	OZ DATE	03 AGENCY	
N/A	•		
01 CKL ENCAPSULATION 04 DESCRIPTION	02 DATE <u>late 1979 or</u> early 1980	03 AGENCY	
Material was packed with lime	and placed under a cement cap.		
01 (1 M. EMERGENCY WASTE TREATMENT 04 DESCRIPTION	O2 DATE	03 AGENCY	
N/A			
01 IN CUTOFF WALLS 04 DESCRIPTION	G2 DATE	03 AGENCY	
N/A			
01 (2) O. EMERGENCY DIKING/SURFACE WATE 04 DESCRIPTION	ER DIVERSION 02 DATE	03 AGENCY	
N/A 01 D P. CUTOFF TRENCHES/SUMP	02 DATE	03.40755	
01 LI P. CUTOFF THENCHES/SUMP 04 DESCRIPTION	V2 DATE	OJ AGENCY	

02 DATE ___

03 AGENCY __

N/A PA PORM 2070-13 (7-81)

01 [] Q. SUBSURFACE CUTOFF WALL 04 DESCRIPTION

N/A



	POTENTIAL HAZARDOUS WASTE SITE		I. IDENTIFICATION
⊕EPA	SITE INSPECTION REPORT PART 10 - PAST RESPONSE ACTIVITIES		PA 568
H PAST RESPONSE ACTIVITIES (Community			
01 (1 R. BARRIER WALLS CONSTRUCTED	OZ DATE	03 AGENCY	
04 DESCRIPTION N/A			
01 DES CAPPING/COVERING 04 DESCRIPTION	02 DATE <u>late 1979 or</u> early 1980	•••	
The material was enclosed wi	th a cement cap as the dumping was	stopped	in 1979
01 () T. BULK TANKAGE REPAIRED 04 DESCRIPTION N/A	OZ DATE	OS AGENCY.	•
01 U. GROUT CURTAIN CONSTRUCTED	02 DATE	00 40ENW	
04 DESCRIPTION N/A	V2 DATE	OS MUENCY.	
01 V. BOTTOM SEALED	02 DATE	03 AGENCY	
04 DESCRIPTION N/A			
01 @ W. GAS CONTROL	OS DATE	03 AGENCY.	
04 DESCRIPTION N/A			
01 D.X. FIRE CONTROL 04 DESCRIPTION	02 DATE	O3 AGENCY.	
N/A			
01 C Y. LEACHATÉ TREATMENT 04 DESCRIPTION	02 DATE	03 AGENCY	
N/A	OZ DATE	A2 ACENCY	
O4 DESCRIPTION N/A	02 Date	US AGENCY.	•
01 1 ACCESS TO SITE RESTRICTED	02 DATE	03 AGENCY	
04 DESCRIPTION N/A			
01 🗆 2. POPULATION RELOCATED	O2 DATE	D3 AGENCY	
04 DESCRIPTION N/A			
01 [] 3. OTHER REMEDIAL ACTIVITIES 04 DESCRIPTION	02 DATE	03 AGENCY.	
N/A			
III. SOURCES OF INFORMATION (Cite assessments)	rantes. e g., state files, semate engines, raptime?		
State DDA and Mile pim in the			
State EPA and NUS FIT III site	e inspection information		



SEPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 11 - ENFORCEMENT INFORMATION

1. IDENTIFICATION
01 STATE 02 SITE NUMBER
PA 568

IL ENFORCEMENT INFORMATION

D1 PAST REGULATORY/ENFORCEMENT ACTION \Box YES Δ NO

OZ DESCRIPTION OF PEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

N/A

III. SOURCES OF INFORMATION (Che assente returness, e.g., state fine, agrain analysis, reserving

NUS FIT III site inspection of June 6, 1984 and State and EPA file information



SECTION 6



6.0 LABORATORY DATA

ORIGINAL (Red)

6.1 Sample Data Summary

The following Quality Assurance Review and Sample Data Summary for volatile organics have been prepared by CRL.

These samples were analyzed for volatile organics only.

SAMPLE DATA SUMMARY Site Name BIShop Tube.

Date of Sample 6 6 8 9 TARGET COMPOUNDS ☐ Organic ☐ [norganic Compounds Detected Sample Description Sample Number and Location Phase Units NDB Upstream Tributary From Site CYYGI Swale **(**a 2024 5 K 1400. 150 8 130 Along RAILTOAD NDB Monitoring well #12 NDB C7083 MONITORING 5K Caay IOK 4800 NDB 4200 690 340 21 41 Well #> Monitoring. ومدارمد 43 7700, 42 1754 C7685 60c 612 Well #> 45 29 C7086 4100 14 2700 160 44 NOB NOB NDRO NDB, NDB, NDBO NDBO CTUST

Remarks

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.

DOWNSTRAM

O Denotes results of questionable qualitative significance based upon quality assurance review of data.

TDD Num EPA Numl	DD Number F3 - 81-05 - 15 PA Number PA - 566				AMPLE D TARGET Organic	COMPO	MMARY PUNDS organic	Site Name SIShop lube											
			-	/	24 24 24 24 24 24 24 24 24 24 24 24 24 2	Security of the second	·//	7	//	//	Compou	nds Dete	cted	7	/ /	 		/	
Sample Number	Sample Description and Location	Phase	Units	75	77.00												F	Remarks	
Cyyga	Vestrenm	AQ	19/L																
Cyyn	Tributary	ΑQ	15/L					,											
C 4492	JWAIC Along RAILRAD	AQ	15/																
Счче	Field Blank	Pa	19/1				÷												
C7083	Monitaring	AQ	14/L)												
C7084	Mondaines Well # 2	Aa	15/	5K	NDB														
C 7085	Monitoring Well #3	AQ	MYL																
S7096	Montained Well #3 Monitoring Well #3 Monitoring Well #1	Aq	19/																
C 7081	Downstream	Aa	15/																
																		=34	ا
																		6 5	
			T			1						1		T	1	7, .	<u> </u>		

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.

 $[\]diamond$ Denotes results of questionable qualitative significance based upon quality assurance review of data.

Site Name: Bishop Tube
TDD No.: F3-8405-15

6.2 Quality Assurance Review

6.2.1 Organic Data: Lab Case 2873

6.2.1.1 Introduction

The findings offered in this report are based upon a review of the volatile organics analyses of nine water samples. Blank analyses results, matrix spike and duplicate analyses results, surrogate spike recoveries, target compound matching quality, tentatively identified compounds, BFB tuning performance, data completeness, calculations, and standards performance were evaluated in detail.

6.2.1.2 Qualifiers

It is recommended that this data package be utilized only with the following qualifier statements:

- All methylene chloride results may be questionable.
- All MEK (2-butanone) results may be questionable.
- All acetone results may be questionable.
- Vinyl acetate results in samples C4490, C4492, and C7085 may be questionable.
- The 1,2-dichloroethane result in sample C7084 may be questionable.
- Concentrations for trichloroethylene in samples C4492, C7084, C7085, and C7086; 1,1,1-trichloroethane in sample C4492, C7084, and C7085; and trans 1,2-dichloroethene in samples C7085 and C7086 may be quantitatively questionable.
- All results for sample C7087 are quantitatively and qualitatively questionable.
- The carbon disulfide result in sample C7084 may be questionable.

6.2.1.3 Findings

Methylene chloride, acetone, and MEK (2-butanone) contamination of the laboratory blanks, method blank, and field blank C4493, were of sufficient magnitude to question the presence of these three compounds in all samples.



Site Name: Bishop Tube
TDD No.: F3-8405-15

The presence of vinyl acetate in samples C4492 and C7085 is questionable because of poor spectral matching quality. In addition, vinyl acetate was observed in the quantitation lists of two laboratory blanks in sufficient quantity to question the vinyl acetate results of samples C4490, C4492, and C7085. The spectra provided for vinyl acetate confirmation in the laboratory blanks is also of poor quality.

- The presence of 1,2-dichloroethane in sample C7084 is questionable because of poor spectral matching quality. The laboratory states that this sample contains a "system contaminant", trichlorotrifluoroethane, which coelutes with 1,2-dichloroethane. The laboratory uses 1,1,2-trichloro-1,2,2-trifluoroethane in oil and grease extractions. Both the enhanced and unenhanced spectra of 1,2-dichloroethane contain constituent ions of the contaminant and the contaminant is present in a concentration at least one order of magnitude greater than 1,2-dichloroethane. There is a possibility this chlorofluorocarbon is a sample constituent, since it was not found in blanks or any other samples. Another chloroflurocarbon was found as a tentatively identified compound and many chlorinated volatile priority pollutants were found in C7084.
- No 1,2-dichloroethane was noted for sample C4492, though the analyte is present on the quantitation list at 2.7 ug/L, above the detection limit of 1 ug/L. No spectral confirmation was provided.
- Diminished quantitative accuracy is suggested for trichloroethylene, 1,1,1,-trichloroethane and trans-1,2-dichloroethene in several samples because instrument response was either saturated or significantly above the calibrated range. The laboratory narrative details efforts to quantify trichloroethylene and 1,1,1-trichloroethane in sample C7084 and trichloroethylene in samples C7085 and C7086 using secondary ions and average response factors calculated utilizing internal standard areas.
- Sample C7087 was run after sample C4492, which contained high levels of the analytes found in C7087. No blank was run after sample C4492 to demonstrate contaminant-free conditions. No spectral confirmations were provided for C7087, no analytes were quantified and instead the lab states--"None detected blank" for each analyte. Many of these analytes were not found in any blank. It is not clear if compounds found in sample C7087 are present, or if they are a result of chromatographic ghosting from sample C4492. All results for C7087 are quantitatively and qualitatively questionable. Sample reanalysis has been requested.
- The quantitation list of sample C7084 noted carbon disulfide at a concentration of 1.6 ug/l, slightly above the laboratory detection limit of 1 ug/l. The lab reported ND-B, None Detected-Blank, though carbon disulfide was not found in any blank. No spectra were included. The presence of carbon disulfide is questionable in sample C7084.



There is one BFB tuning violation, occurring just before the three point standard curve was established at 10:19 on 6/11/84. Three ions are out of specified ranges by small amounts. All tunes of 6/12/84, when the samples were run, are of acceptable quality.

- Most dg-toluene surrogate recoveries were outside of QC limits. The laboratory notes this surrogate was not quantitatively accurate and states they will correct the problem.
- Eight matrix spike recoveries and two Relative Percent Difference Checks were out of QC limits. Some of these were due to the laboratory's decision to spike a sample containing high levels of the compounds of interest, as mentioned in the laboratory narrative. These recoveries demonstrate the laboratory's problems in accurately quantifying analytes outside the working range of the standards. Most recoveries are consistently high. More useful QC information may have been obtained if the laboratory had chosen a lower level sample to spike.
- No screening for volatiles was performed by the laboratory.

6.2.1.4 Summary

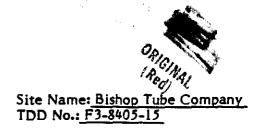
This Quality Assurance Review has identified blank contamination, poor matrix recoveries, improper usage of "ND-B" code, quantification of analytes outside the working range of standards, a minor BFB tuning violation, and possible chromatographic ghosting as primary areas of concern.

Please see the accompanying support documentation appendix for specifics on this Quality Assurance Review.

Report	prepared	bу	(b) (4)	Date:	
•		•			



SECTION 7



7.0 TOXICOLOGICAL EVALUATION

ORIGINAL (Red)

7.1 Summary

Sample analysis in this investigation was restricted to the detection of volatile organics only. Chlorinated ethanes and ethenes (up to 20,000 ug/l), some of which are suspect human carcinogens, and vinyl chloride (up to 44 ug/l), a recognized human carcinogen, were reported in samples from 3 monitoring wells (MW) underlying the site, and in a surface water sample from a swale adjacent to the site. Ingestion of the groundwater could potentially pose a carcinogenic risk.

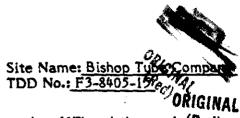
The presence of volatile organic contaminants in the downstream surface water sample could not be determined due to laboratory error. Based on available data regarding the effects of the identified contaminants on freshwater aquatic life, their lack of persistence in surface waters, and their lack of a tendency to strongly bioaccumulate, the levels of contaminants noted in the swale sample would be expected to have minimal environmental effects.

It is possible that ppb concentrations of contaminants may be present in the ambient air on site or in the vicinity of the site. If present, they might pose a health hazard to local residents.

7.2 Distribution of Contaminants

Only volatile organics were assayed for in this investigation. Whether inorganic or other organic priority pollutants are present at or near this site is not known.

Chlorinated aliphatics were identified in samples from 3 on-site MWs and in the surface water sample from the swale alongside the railroad tracks. There were no volatile organics identified in MW no. 1.



Vinyl chloride was measured in 1 MW at 44 ug/l, and in another MW and the swale(Red) below the minimum quantifiable limit of 10 ug/l. The following ethanes and ethenes were measured in MW samples and in the sample from the swale. The swale was reported by the FIT III team to be discolored.

	Monitoring Wells (ug/l)	Swale (ug/l)
trichloroethene	4,800 - 20,120	2,026
1,1,1-trichloroethane	45 - 7,700	1,400
1,1-dichloroethane	14 - 54	9
1,1-dichloroethene	• 29 - 690	130
trans-1,2-dichloroethene	340 - 2,700	150
tetrachloroethene	21 - 60	8

Due to limitations in instrumentation response, all data for trichloroethene and 1,1,1-trichloroethane, as well as 2 MW values for 1,2-dichloroethene are considered by the quality assurance chemist to be quantitatively questionable. The actual concentrations in some cases may actually be higher than those reported.

Toluene (6 ug/l) and chloroform (below the minimum quantifiable limit of 5 ug/l) were identified in MW no. 2. Toluene was also identified in the swale sample (below the minimum quantifiable limit of 5 ug/l). The presence of 1,2-dichloroethane in MW no. 3 is questionable. MW samples were all acidic, with pHs ranging from 5.93 to 6.15. Acidic groundwater may be a natural hydrological feature of the area.

Chlorinated ethane/ethene levels in the downstream aqueous sample were all reported by the laboratory as ND-B (not detectable due to blank contamination). According to the FIT III quality assurance chemist, many of the contaminants were not present in the blanks; ghosting, however, may have been a problem. Resampling of the downstream site would be necessary to confirm the presence or absence of these contaminants. There were no volatile organic contaminants confidently identified in surface water samples taken upstream of the site.



7.3 Toxicological Considerations

There is evidence that contaminants may be migrating from this site. Volatile organic contaminants were identified in samples taken from 3 on-site MWs, and the surface water (swale) adjacent to the site. They were not detected in samples from upstream surface waters. Their presence in a downstream sample could neither be confirmed nor ruled out. Of all contaminants identified, the highest concentration was of trichloroethene (TCE). A 4,000-gallon storage tank of TCE is reported to be present on site.

Chlorinated aliphatics tend to be persistent and highly mobile in groundwater. Based on a limited study, groundwater flow is expected to be towards the north and east, away from the direction of known current groundwater usage. Fractures in the underlying geology, however, make the prediction of flow difficult.

TCE is a suspect human carcinogen. Based on limited data from animal studies, it has been estimated by EPA's. Carcinogen Assessment Group that the lifetime consumption of 2 liters of water/day containing 180 ug/1 TCE could result in 1 additional case of cancer for every 10,000 individuals exposed. Using liver toxicity as the most sensitive endpoint, an Adjusted Acceptable Daily Intake (AADI) of 257 ug/1 has been calculated. AADIs are calculated to protect against toxicities other than carcinogenic risk. The World Health Organization has recommended 30 ug/1 as a tentative guideline for drinking water. 1

1,1,1-Trichloroethane is not presently considered a carcinogen by EPA, although there is recent limited evidence for carcinogenicity in animals. Based on the preliminary animal data, it has been estimated that the lifetime consumption of 2 liters of water/day containing 21.7 ug/l could result in 1 additional case of cancer for every 1,000,000 individuals exposed. An AADI of 1,000 ug/l has been calculated, using liver damage as the most sensitive endpoint. \(\frac{1}{2} \)



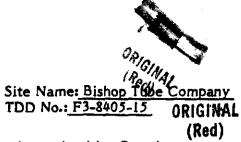
There is insufficient information concerning the carcinogenicity of, or effects (Red) chronic low-level exposure to, 1,1-dichloroethane. At high concentrations it can cause cardiac excitation in humans, and has been shown to produce liver toxicity in rodents.²

1,1-Dichloroethene has limited evidence of carcinogenicity in animals. Based on animal evidence, it is estimated that the lifetime consumption by humans of water containing 2.3 ug/l could result in 1 additional case of cancer for every 1,000,000 individuals exposed. An AADI of 350 ug/l has been calculated. The toxic effects of 1,2-trans-dichloroethene are not well-documented. There is insufficient evidence as to whether or not it is a carcinogen.

Tetrachloroethene (PCE) has limited evidence of carcinogenicity in animals. Based on animal data, it has been estimated that the lifetime consumption of 2 liters of water/day containing 10 ug/l could result in 1 excess case of cancer for every 100,000 individuals exposed. An AADI of 85 ug/l has been calculated, based only on toxic effects to blood components, the immune system, and the central nervous system. The World Health Organization has recommended a level of 10 ug/l as a tentative guideline for PCE in drinking water. I

Vinyl chloride is a recognized human and animal carcinogen, angiosarcoma of the liver being the most common tumor produced. It has been estimated that the consumption over a lifetime of water containing 0.015 ug/l could cause I additional case of cancer for every 1,000,000 individuals exposed.

The levels of toluene measured in the groundwater would not be expected to cause any adverse health effects if ingested. Chloroform has evidence of carcinogenicity in animals. It has been estimated that the lifetime consumption of 2 liters of water/day containing approximately 1.9 ug/l could result in 1 additional case of cancer for every 100,000 individuals exposed.



Ingestion of the groundwater could potentially pose a carcinogenic risk. Based on the maximum levels of individual volatile organics measured in MW samples, it can be calculated, for the sake of perspective, that the lifetime ingestion of the groundwater might result in approximately a 7.7 in 1,000 cancer risk. In addition, reported levels of trichloroethene, 1,1,1-trichloroethane, and 1,1-dichloroethene exceed AADIs calculated to protect against toxicities other than cancer, and could potentially affect the liver.

Based on available experimental data, it would not be expected that concentrations of volatiles similar to those reported in the swale would cause acute toxicity to aquatic life. 2,7-10 There is a paucity of data concerning potential chronic effects. However, volatile organics do not tend to persist in surface waters or substantially bioaccumulate, so that any long-term effects would be expected to be minimal. Groundwater is reported to discharge into the unnamed tributary of Little Valley Creek, and could potentially affect aquatic life. Chronic exposure to levels of TCE similar to the maximum concentration measured in groundwater samples (approximately 20,000 ug/1) has been reported to have behavioral effects on a species of freshwater fish. It would be expected, however, that dilution of contaminants would occur as they entered the surface water and, as previously noted, would not tend to persist. The presence of volatile organics in downstream surface water could neither be confirmed nor ruled out.

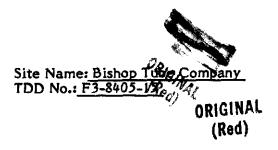
Dermal contact with water in the swale would probably result in the absorption of only small amounts of contaminants. Since some of the contaminants are known or suspect carcinogens, no safe levels of exposure to these substances can be assumed. However, any anticipated health risks from dermal exposure would be expected to be low.



ORIGINAL (Red)

Although HNU readings of ambient air did not exceed background, it is possible that ppb concentrations of some contaminants could be present on site, as well as in the surrounding area. Low ambient air levels of some contaminants, if present, could potentially pose health hazards in individuals living near the site, if inhaled on a chronic basis. An HNU reading of 6 ppm was recorded when uncapping MW no. 2. Although this level is relatively low, the nature of the gas(es) is not known. Based on the sample data, it is likely to be composed of chlorinated aliphatics. Brief inhalation of this level of chlorinated aliphatics is likely to pose a limited health hazard.





LIST OF SOURCES

- Federal Register. June 12, 1984. National Primary Drinking Water Regulations: Volatile Synthetic Organic Chemicals; Proposed Rulemaking. 49 (114): 24330.
- 2. U.S. Environmental Protection Agency. 1980. Ambient Water Quality Criteria for Chlorinated Ethanes. EPA PB81-117400.
- 3. U.S. Environmental Protection Agency. 1980. Draft Criteria Document for Dichloroethylenes. EPA PB84-199546.
- 4. U.S. Environmental Protection Agency. 1984. Draft Criteria Document for Vinyl Chloride. EPA PB84-199538.
- 5. Sandmeyer, E.E. 1981. Aromatic hydrocarbons. In: Patty's Industrial Hygiene and Toxicology, 3rd ed. G.D. Clayton and F.E. Clayton (eds.) pp. 3283-91. New York: John Wiley and Sons.
- 6. U.S. Environmental Protection Agency. 1980. Ambient Water Quality Criteria for Chloroform. EPA PB81-117442.
- 7. U.S. Environmental Protection Agency. 1980. Ambient Water Quality Criteria for Trichloroethylene. EPA PB81-117871.
- 8. U.S. Environmental Protection Agency. 1980. Ambient Water Quality Criteria for Dichloroethylenes. EPA PB81-117525.
- 9. U.S. Environmental Protection Agency. 1980. Ambient Water Quality Criteria for Tetrachloroethylene. EPA PB81-117830.
- 10. U.S. Environmental Protection Agency. 1980. Ambient Water Quality Criteria for Toluene. EPA PB81-117855.



APPENDIX A





ACCOUNT NO ACCOUNT NO 3. PRIORITY: 4. ESTIMATE OF TECHNICAL HOURS: 1. NEFERENCE INFO: 1. NEW INFO 3. WAS AFTER QA 2. PRICK UP 2. NO. 3. WAS AFTER QA 2. NO. 4. Contact state and local agencies for relevant information. 3.) Submit sampling plan to EPA for approval. 4.) Coordinate lab analysis. 5.) Conduct on and off site inspection and sampling. 6.) Take and ship samples according to standard protocol. 7.) Perform Quality Assurance Review of lab data. 8.) Prepare and submit report. 11. DESIRED REPORT FORM: FORMAL REPORT 1. LETTER REPORT 1. FORMAL BRIEFING 1. OTHER ISPECIFY: 12. COMMENTS: 13. AUTHORIZING RPD: 14. DATE: 15. RECEIVED BY: 16. DATE: 16. DATE: 16. DATE: 16. DATE:					
TECHNICAL HOURS: 200 PA-568 MEDIUM AA. ESTIMATE OF SUBCONTRACT COST: Bishop Tube Co. Prazer, PA 3 wks after QA PICK UP SPECIFIC ELEMENTS: 1.) Review background information. 2.) Contact state and local agencies for relevant information. 3.) Submit sampling plan to EPA for approval. 4.) Coordinate lab analysis. 5.) Conduct on and off site inspection and sampling. 6.) Take and ship samples according to standard protocol. 7.) Perform Quality Assurance Review of lab data. 8.) Prepare and submit report. 11. DESIRED REPORT FORM: FORMAL REPORT A LETTER REPORT FORMAL BRIEFING OTHER ISPECIFYI: 12. COMMENTS: 13. AUTHORIZING RPO: (SIGNATURE) 14. DATE: (SIGNATURE) 15. RECEIVED BY: ACCEPTED ACCEPTED WITH EXCEPTIONS REJECTED 16. DATE:			- · · · - · - · · · · · · · · ·	(ס	
TECHNICAL HOURS: 200 PA-568 MEDIUM AA. ESTIMATE OF SUBCONTRACT COST: Bishop Tube Co. Prazer, PA 3 wks after QA PICK UP SPECIFIC ELEMENTS: 1.) Review background information. 2.) Contact state and local agencies for relevant information. 3.) Submit sampling plan to EPA for approval. 4.) Coordinate lab analysis. 5.) Conduct on and off site inspection and sampling. 6.) Take and ship samples according to standard protocol. 7.) Perform Quality Assurance Review of lab data. 8.) Prepare and submit report. 11. DESIRED REPORT FORM: FORMAL REPORT A LETTER REPORT FORMAL BRIEFING OTHER ISPECIFYI: 12. COMMENTS: 13. AUTHORIZING RPO: (SIGNATURE) 14. DATE: (SIGNATURE) 15. RECEIVED BY: ACCEPTED ACCEPTED WITH EXCEPTIONS REJECTED 16. DATE:	· · ·				PAZZSI
MEDIUM AA. ESTIMATE OF SUBCONTRACT COST: Bishop Tube Co. Frazer, PA 3 wks after QA MINTERIM DEADLINES: 1. Review background information. 2.) Contact state and local agencies for relevant information. 3.) Submit sampling plan to EPA for approval. 4.) Coordinate lab analysis. 5.) Conduct on and off site inspection and sampling. 6.) Take and ship samples according to standard protocol. 7.) Perform Quality Assurance Review of lab data. 8.) Prepare and submit report . 11 DESIRED REPORT FORM: FORMAL REPORT LETTER REPORT FORMAL BRIEFING TOTHER (SPECIFY): 12. COMMENTS: 13. AUTHORIZING RPO: 14. DATE: 15. RECEIVED BY: ACCEPTED WITH EXCEPTIONS REJECTED 16. DATE:	3. PRIGRITY:		5. EPA SITE IO:	6. COMPLETION DA	TE: 7. REFERENCE INFO.:
SUBCONTRACT COST: Bishop Tube Co. Frazer, PA	☐ HIGH	200	PA-568		X YES NO
Sinop tube Co. Review Description: Perfidm site inspection of subject site.	X MEDIUM		SA. EPA SITE NAME:	7	ATTACHED
8. GENERAL TASK DESCRIPTION: Perfidm site inspection of subject site. 9. SPECIFIC ELEMENTS: 10. INTERIM DEADLINES: 1.) Review background information. 2.) Contact state and local agencies for relevant information. 3.) Submit sampling plan to EPA for approval. 4.) Coordinate lab analysis. 5.) Conduct on and off site inspection and sampling. 6.) Take and ship samples according to standard protocol. 7.) Perform Quality Assurance Review of lab data. 8.) Prepare and submit report. 11. DESIRED REPORT FORM: FORMAL REPORT LETTER REPORT FORMAL BRIEFING OTHER (SPECIFY): 12. COMMENTS: 13. AUTHORIZING RPD: 14. DATE: 15. RECEIVED BY: ACCEPTED ACCEPTED WITH EXCEPTIONS REJECTED 16. DATE:	CT LOW	SUBCONINACI COSI:	Bishop Tube Co.		(V) piev ija
9. SPECIFIC ELEMENTS: 1.) Review background information. 2.) Contact state and local agencies for relevant information. 3.) Submit sampling plan to EPA for approval. 4.) Coordinate lab analysis. 5.) Conduct on and off site inspection and sampling. 6.) Take and ship samples according to standard protocol. 7.) Perform Quality Assurance Review of lab data. 8.) Prepare and submit report. 11 DESIRED REPORT FORM: FORMAL REPORT LETTER REPORT FORMAL BRIEFING . OTHER (SPECIFY): 12. COMMENTS: 13. AUTHORIZING RPO: (SIGNATURE) 14. DATE: (SIGNATURE) 15. RECEIVED BY: ACCEPTED ACCEPTED WITH EXCEPTIONS REJECTED			Frazer, PA	3 wks after	QA A A A A A A A A A A A A A A A A A A
1.) Review background information. 2.) Contact state and local agencies for relevant information. 3.) Submit sampling plan to EPA for approval. 4.) Coordinate lab analysis. 5.) Conduct on and off site inspection and sampling. 6.) Take and ship samples according to standard protocol. 7.) Perform Quality Assurance Review of lab data. 8.) Prepare and submit report . 11. DESIRED REPORT FORM: FORMAL REPORT LETTER REPORT FORMAL BRIEFING . 12. COMMENTS: 13. AUTHORIZING RPO: (SIGNATURE) 14. DATE:	4 SPECIEIC ELEMENTS				10. INTERIM
3.) Submit sampling plan to EPA for approval. 4.) Coordinate lab analysis. 5.) Conduct on and off site inspection and sampling. 6.) Take and ship samples according to standard protocol. 7.) Perform Quality Assurance Review of lab data. 8.) Prepare and submit report . 11. DESIRED REPORT FORM: FORMAL REPORT A LETTER REPORT FORMAL BRIEFING OTHER (SPECIFY): 12. COMMENTS: 13. AUTHORIZING RPO: 14. DATE: (SIGNATURE) 15. RECEIVED BY: ACCEPTED WITH EXCEPTIONS REJECTED					DEAGLINES:
4.) Coordinate lab analysis. 5.) Conduct on and off site inspection and sampling. 6.) Take and ship samples according to standard protocol. 7.) Perform Quality Assurance Review of lab data. 8.) Prepare and submit report. 11. DESIRED REPORT FORM: FORMAL REPORT LETTER REPORT FORMAL BRIEFING OTHER (SPECIFY): 12. COMMENTS: 13. AUTHORIZING RPO: (SIGNATURE) 14. DATE: (SIGNATURE) 15. RECEIVED BY: ACCEPTED MITH EXCEPTIONS REJECTED	2.) Contact sta	te and local agencies for	relevant information.		
4.) Coordinate lab analysis. 5.) Conduct on and off site inspection and sampling. 6.) Take and ship samples according to standard protocol. 7.) Perform Quality Assurance Review of lab data. 8.) Prepare and submit report. 11. DESIRED REPORT FORM: FORMAL REPORT LETTER REPORT FORMAL BRIEFING OTHER (SPECIFY): 12. COMMENTS: 13. AUTHORIZING RPO: (SIGNATURE) 14. DATE: (SIGNATURE) 15. RECEIVED BY: ACCEPTED MITH EXCEPTIONS REJECTED	3.) Submit sam	oling plan to EPA for app	roval.		
6.) Take and ship samples according to standard protocol. 7.) Perform Quality Assurance Review of lab data. 8.) Prepare and submit report. 11. DESIRED REPORT FORM: FORMAL REPORT LETTER REPORT FORMAL BRIEFING OTHER (SPECIFY):					
7.) Perform Quality Assurance Review of lab data. 8.) Prepare and submit report. 11. DESIRED REPORT FORM: FORMAL REPORT LETTER REPORT FORMAL BRIEFING 12. COMMENTS: 13. AUTHORIZING RPO: 14. DATE: (SIGNATURE) 15. RECEIVED BY: ACCEPTED ACCEPTED WITH EXCEPTIONS REJECTED 16. DATE:	5.) Conduct on	and off site inspection ar	nd sampling.		
8.) Prepare and submit report. 11. DESIRED REPORT FORM: FORMAL REPORT LETTER REPORT FORMAL BRIEFING 12. COMMENTS: 13. AUTHORIZING RPO: 14. DATE: (SIGNATURE) 15. RECEIVED BY: ACCEPTED ACCEPTED WITH EXCEPTIONS REJECTED 16. DATE:	6.) Take and shi	ip samples according to s	tandard protocol.		
11. DESIRED REPORT FORM: FORMAL REPORT LETTER REPORT FORMAL BRIEFING OTHER (SPECIFY): 12. COMMENTS: 13. AUTHORIZING RPO: (SIGNATURE) 15. RECEIVED BY: ACCEPTED ACCEPTED WITH EXCEPTIONS REJECTED 16. DATE:	7.) Perform Qua	ality Assurance Review o	of lab data.		_
OTHER (SPECIFY): 12. COMMENTS: 13. AUTHORIZING RPO: (SIGNATURE) 14. DATE: (SIGNATURE) 15. RECEIVED BY: ACCEPTED ACCEPTED WITH EXCEPTIONS REJECTED 16. DATE:	8.) Prepare and	submit report.			_
OTHER (SPECIFY): 12. COMMENTS: 13. AUTHORIZING RPO: (SIGNATURE) 14. DATE: (SIGNATURE) 15. RECEIVED BY: ACCEPTED ACCEPTED WITH EXCEPTIONS REJECTED 16. DATE:					
13. AUTHORIZING RPO: (SIGNATURE) 15. RECEIVED BY: ACCEPTED ACCEPTED WITH EXCEPTIONS REJECTED 16. DATE:				FOI	TMAL BRIEFING
(SIGNATURE) 15. RECEIVED BY: ACCEPTED ACCEPTED WITH EXCEPTIONS REJECTED 16. DATE:	12. COMMENTS:				
(SIGNATURE) 15. RECEIVED BY: ACCEPTED ACCEPTED WITH EXCEPTIONS REJECTED 16. DATE:					
15. RECEIVED BY: ACCEPTED ACCEPTED WITH EXCEPTIONS REJECTED 16. DATE:	13. AUTHORIZING RPO:				14. DATE:
ACCEPTED ACCEPTED WITH EXCEPTIONS REJECTED		(SIGNATU	RE)		
(CONTRACTOR RPM SIGNATURE)	15. RECEIVED BY:	ACCEPTED AC	CEPTED WITH EXCEPTIONS	☐ WEJECTED	16. DATE:
		ICONTRACTOR RPM	SIGNATURE)	 }	

Sheet 1 Sheet 2 White - FITL Copy Canary - DPO Copy

Sheet 3 Sheet 4 Pink — Contracting Officer's Copy (Washington, D. C.) Goldenrod — Project Officer's Copy (Washington, D. C.)



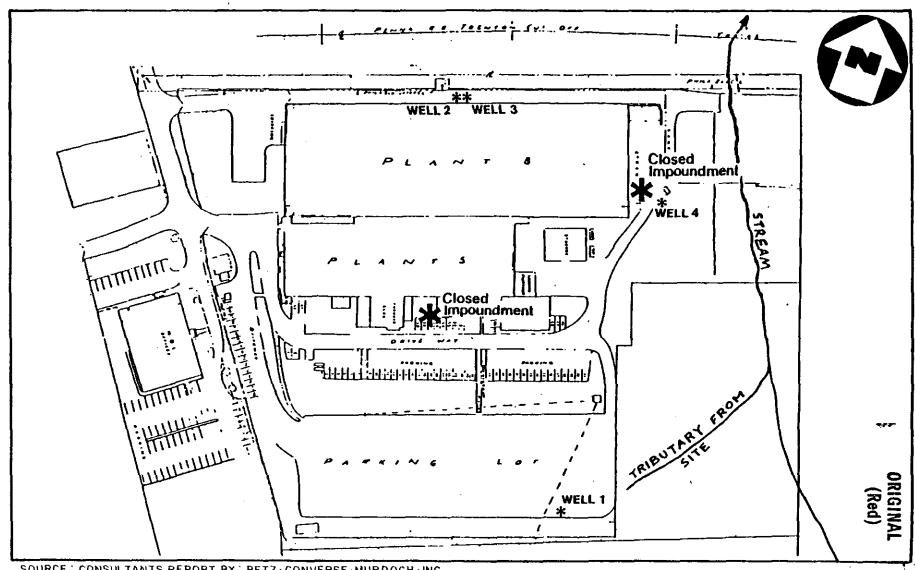
APPENDIX B



SITE LOCATION MAP BISHOP TUBE CO., FRAZER, PA.

SCALE 1:24000



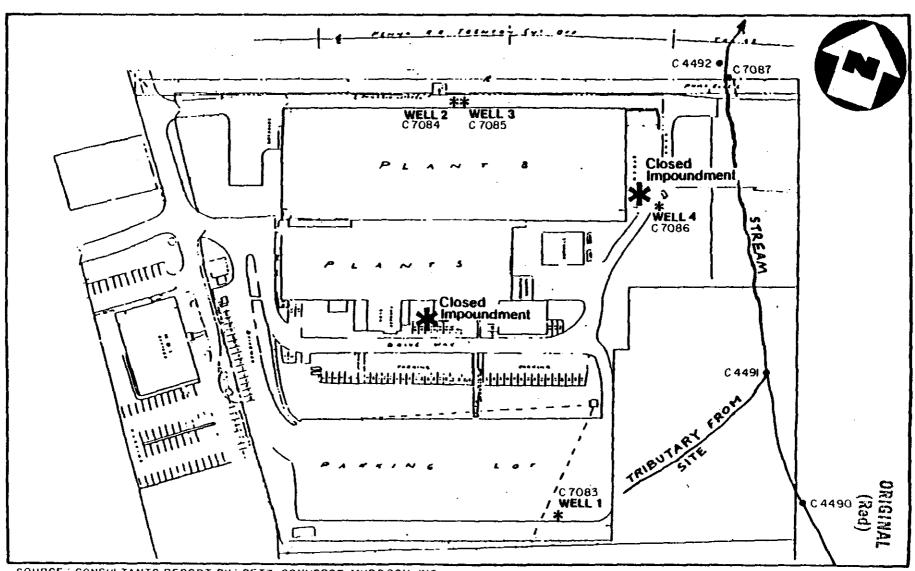


SOURCE: CONSULTANTS REPORT BY: BETZ-CONVERSE-MURDOCH-INC.

SITE SKETCH BISHOP TUBE CO., FRAZER, PA.

(NO SCALE)



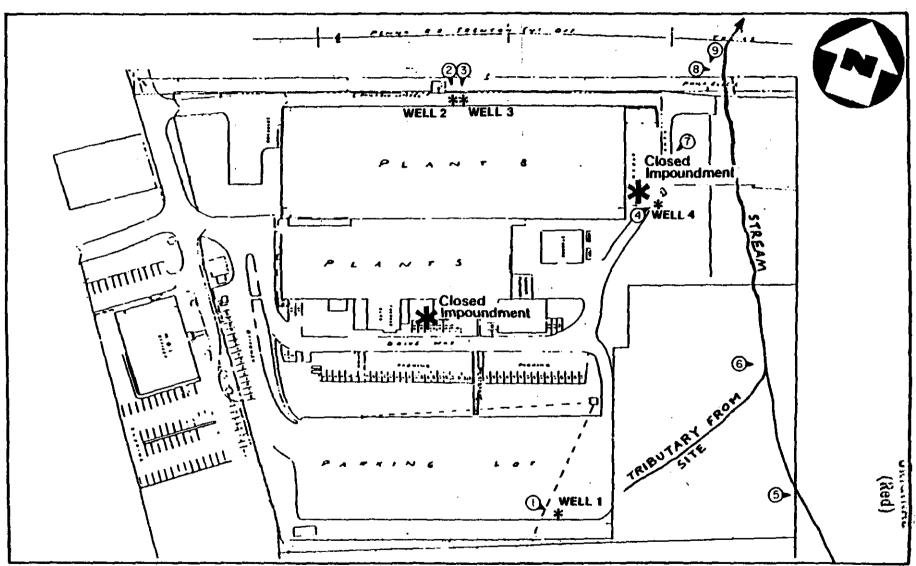


SOURCE ; CONSULTANTS REPORT BY : BETZ - CONVERSE - MURDOCH - INC.

SAMPLE LOCATION MAP
BISHOP TUBE CO., FRAZER, PA.

(NO SCALE)





SOURCE: CONSULTANTS REPORT BY: BETZ-CONVERSE-MURDOCH-INC.

PHOTO LOCATION MAP
BISHOP TUBE CO., FRAZER, PA.

(NO SCALE)





APPENDIX C

PROJECT	NAME:	bicho	()	Tibe
TOD NO:	1, -	74C5-	15	



		LYSIS LAB D	REVIEW OF ATA PACKAGE	_	GINAL Red)		
Case No.: 2973	A	oplicable Sam	· ("==	\\$\\			
Contract No.: (6)-01-6	(C)		Cyygi		173 1		
Contract Laboratory: ERO (12.	Contraction of Sugar		िपपन	2 03	575		
Applicable IFB No.: WA 53			(Stell) C 44	^ - <i>/</i>	1081-		
Reviewer: C.SANDS					1097		
Review Date: 7 19 34				· · · · · · · · · · · · · · · · · · ·			
The organic analytical data for summarized in the following to		en reviewed.	The quality assur	rance evalua	tion is		
Reviewer's Evaluation*		Fract	ion				
	VOLATTICS	1000	BASE/	PCB/	5000		
4	VOLATILES	ACIDS	NEUTRALS	PEST.	TCDD		
Acceptable	<u> </u>				 		
Acceptable with exception(s)	11.3.34 553			 			
Questi onable	•			1/			
Unacceptable * Definitions of the evaluation	<u> </u>	<u> </u>		<u> </u>	<u> </u>		
This evaluation was based upon an analysis of the review items indicated below: ① DATA COMPLETENESS ② TARGET COMPOUND MATCHING QUALITY ② BLANK ANALYSIS RESULTS ② TENTATIVELY IDENTIFIED COMPOUNDS ② SURROGATE SPIKE RESULTS ② CHROMATOGRAPHIC SENSITIVITY CHECKS ② MATRIX SPIKE RESULTS ③ DUPLICATE ANALYSIS RESULTS ③ STANDARDS ② CALIBRATION CHECK STANDARDS							
Q QUANTITATIVE CALCUI	LATIONS	₽ INTE	ERNAL STANDARI	DS PERFOR	MANCE		
Data review forms are att		the review it	ems indicated abov	ve.			
† No errors noted, no form a	ittached.						
Spot Check performed.		1 .	_				
	= DATA Co						
			: lecons				
(z) :.	· Single- pole	C 8 1/2 1					
1.							
7. T.	n in grafina. Portugist in	,	A 10 12 - 12.		-1,		
1.	o de jota dina	,	April 1		-1.		



DATA EVALUATION SCORE CATEGORIES

ACCEPTABLE: Data is within established control limits, or the data which is outside established control limits does not affect the validity of the analytical results.

ACCEPTABLE WITH EXCEPTION(S): Data is not completely within established control limits. The deficiences are identified and specific data is still valid, given certain qualifications which are listed below.

QUESTIONABLE: Data is not within established control limits.

The deficiences bring the validity of the entire data set into question. However, the data validity is neither proved nor disproved by the available information.

<u>UNACCEPTABLE</u>: Data is not within established control limits.

The deficiences imply the results are not meaningful.

	<u></u>				,	,			, , , , , , , , , , , , , , , , , , , 		.			
· DAT			-1442	CHAI	, dair	13010	بمناعد المالية	Caren	ميمال.	1270		_		
COMPLET	TENESS	CONC./MATRIX	9.0	48	Ac	1. 0	7.0	40	15	1/2	11814	-		<u> </u>
	TRAFFIC	REPORT #	j								Neg'		4	
FRACTION	LAB 1.0.	#	Viens, is,	Vinger	11300.12	V1501.22	V109/-12	1100634	tions:R	برايراجوا		(Re	B)	
VOA :	RUN DAT	E/TIME	1-12.	15:3	16 15H	7:10	3/17	9:17	155°	12-12 19:51	13:45			
	TARGET	COMPOUND TAB.	<u>بر</u>		w	U.	U	'رن	U					
	TARGET	COMPOUND D.L.	· ·	ر ا	U	/	U-	V	6-1	201	<i>L'</i>			
	TENT. I.D.	COMPOUND TAB.		ا اس	~	J.,	-	1	V		1			
	SURROGA	TE RECOVERY	د	0	U		U	V	15	/	1		, <u>-</u> "	
17-7	GC SCRE	EN TABULATION	NIS	145	185	is	1ic	111	100	145	$h \leq$			
	GC/MS CH	ROMATOGRAMS	L	./	V	/	1		1	V	1			
	TARGET (MPD. QUAN. LIST	1	./	v	7	7	/	7	1	<u>ب</u>			
] [TARGET	MPD. SPECTRA		7		1	/	7	/	1	~	1.5		
[]	TENT. I.D.	.CMPD. Q.L.	7		V.	V			1	/	1			
') _	TENT. CM	IPD. LIB. SRCH.	V		V		_ /	\			2/	•		
	CHRO./SE	ENS, CHECKS	υl.	2	7	计	- لمن	·}-	7	7	لز			
	8F8/OFTF	PP TUNE DATA	V	V	,		١)	~	'	\			
12	I.S AREAS CHARTS I.S. REL. RESP. FORM RF B AMTS.: CALIB. CHK.		11/	1.5	WS	Nic.	496	135	10-	1/2	1115			
			INS	MS	Ĺ	MS	MS	MS	<i>M</i> S	MS	71			
			1	V	1	1	レ	160	رما س	V	6			
	RF 8 AMT	S.: 3-PT CALIB.		•)	'	V	ン	レ	<u></u>)			
	Chromato	grams: Calib.Chk.	·/		<u></u>	'سرر		سمسا	-	-	-			
	Chromato	grams: 3-Pt.Calib.			·/	<u> </u>	<u>ب</u>			レ		10 mg	4	
· .	LINEARIT	Y:3-PT.CALIB	4	7	4	4	4	7	-/	4	2.5			
	RF COMP	ARISON	1/	~	<u>~</u>	W	V	٠٠٠.	<u>ر</u>	<i>(</i>	J			
	SAMPLE/	FIELD BLANK	1	-	-		٠	/	/	/	V			
' .	METHOD/	INSTR. BLANK		U'		-	U	1	/	/	✓ .			
	LAB DUP	LICATE												
	FIELD DU	P/REP												
	MAT. SPK	./M. STD.	1	/	/	/	/		/		<u>ب</u>			
2	COMMENT	s: DIAR	ارج	ي م لم دو د ا ص	11 ₁ N	0 V	<u>0 1970</u>	<u>50 ic</u>	en in	<u> </u>	វប៉ា គ	<u> </u>	,:	_
-	Ø ?		501 - 13							a tini	rd.pr.5	24 mm	PHOILT	JECCT NOVA
-	(3) 1							DA-						
_		ري لو ما به الم	Cel	11.cie)/~		
-	<u> </u>	fut costs	الاستنام	6								`		
<u>[</u> , 2]	2 11	المليل والمحارات	i : A1	10 01	130	UNT.	STAME	141 D	Follow					
_			·											
-														
-										-				
MI	MISS IND IS INFO REDUCTION SMO FIGHT							7/19/	14					



KEY TO DATA COMPLETENESS FORM

Abbreviation Used on Form	Description of Checklist Item
Conc./Matrix	Concentration category submitted in analysis request (low, med, hi); and matrix (sol., aq.)
Fraction	Fill in acid, base/neutral, acid/base/neutral, or volatiles analysis
Run Date/Time	Instrument run date (to be used for correlating calibration)
Target Cmpd. Tab.	Tabulated results for target compounds
Target Cmpd. D.L.	Detection limits for target compounds (actual/level indicated by screen
Tent. LD. Cmpd. Tab.	Tabulated results for tentatively identified compounds
Surr. Rec.	Surrogate recoveries results
GC Screen Tab.	Tabulated GC screen results indicating required level of followup
GC/MS Chromatograms	Chromatograms of GC/MS analysis runs
Target Cmpd. Quan. List	Target compounds quantitation list, showing areas, ret. times
Target Cmpd. Spectra	Enhanced and unenhanced spectra of target compound hits
Tent. LD. Cmpd. Q.L.	Quantitation list for tentatively identified compounds
Tent. Cmpd. Lib. Srch.	Spectra and library match spectra of tentatively identified compounds
Chro./Sens. Checks	EICP's and R.R.F.'s for chromatographic sensitivity checks
BFB/DFTPP Tune Data	Spectra intensity lists, and criteria comparison forms for BFB, DFTPP
I.S. Areas Charts	Internal standards area control charts and description of remedial action
I.S. Rel. Resp. Form	Internal standards relative response listings for each sample run
RF and amts.: Calib. Chk.	Tabulated response factors and amount injected for all empds. in calibration check
RF and amts.: 3-Pt. Calib. Chromatograms: Calib. Chk.	Tabulated response factors and amount injected for all cmpds. in 3-point calibration Chromatograms for calibration check standard
Chromatograms: 3-Pt. Calib.	Chromatograms for 3-point multilevel calibration standards.
Linearity: 3-Pt. Calib.	Tabulated correlation coefficient or relative standard deviation for calibration
RF Comparison	Tabulated comparison of calibration Response Factor with check standard
Sample/Field Blank	Equipment rinse or reagent water blank shipped with samples from field
Method/Instr. Blank	Method or instrument blank which is prepared at lab
Lab Duplicate	Sample which was split by lab for duplicate analysis
Field Dup/Rep	Sample which was split or collected twice in the field
Mat. Spk./M. Std.	Matrix spike or method standard (blind, or done by lab)
Pest. Tab.	Tabulated results for pesticides
Pest. D.L. Tab.	Tabulated detection limits for pesticides
Pest. Ciro.	Chromatograms for pesticide screening
2 nd Col. Conf.	Confirmation of pesticide results by using a second GC column and temperature
GC/MS Conf.	Confirmation of pesticide results by GC/MS analysis
Pest. Dup., Spk. Blk.	Pesticide duplicate, spike, and blank
Pest. Std. Chro.	Chromatogram of pesticide standard
Pest. Std. LD.	Pesticide standard identification form
TCDD	2,3,7,8-tetrachlorodibenzodioxin

TCDD Tab., D.L., EICP, Blk.

KEY TO SYMBOLS USED IN DATA COMPLETENESS TABLE

Symbol .	Meaning	<u>Symbol</u>	Meaning
	Data item present	1	Incomplete data item
NA	Data item not applicable or not required	NC	Data item not clearly explained
P	Data item within established control limits		(units of conc., etc)
F	Data item outside established control limits	• or [number]	See footnote
MS	Missing item	XX/XX/XX XX:XX	Date/Time of run (calibration, etc.)

TCDD tabulated results, detection limits, extracted ion current profile, blank

RUN CHRONICI È

			R	UN CHRON	00.			
FRAC	CTION: 171	•	FRAC	TION:	FRACTIONIA, URIGINAL			
RUN ORDER	RUN ID/ DESCRIPTION	DATE TIME	RUN ORDER	RUN ID/ DESCRIPTION	DATE TIME	RUN ORDER	RUN ID/ DESCRIPTION	DAT
	7,20,24,17.	117.17						
	1,0 1, 27, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	1-1-						
	7,300 - (611 11)	9-11						
	<u> </u>							
	V 100 SC12H	3-13:105						+
	YBUE SIZA	11.00						
:	12.12.61.4						-	+
	V 109/221	2.17	-					
<u>-</u>	Method 12 lang VIOA622 Field Clark	3.12					<u> </u>	1
	C 4413 V101623	6.12					<u>. </u>	+
-	V109 624	C'C'		•			= -, -	
	Caver	31.15					<u> </u>	+
	VIO SIZB	2-12-1110					<u></u>	1
	YBIR GIZC	10-14						+
	V 10-1-01.2	13/51					. •	+
	<u> </u>			-				+
	C44177 √104 5 17 2447.	7514	<u> </u>					+
	1 09(-2:	7.01	 				-	+
	C =35 F =	3.17						+
	C ३०ह ⁷ ,							+
	VAND CARTER A	3 1						+
	And Spilling and	77.5						+
	V1096171	1.17					<u> </u>	1
	V 109(- 5	63.0		<u></u>				
	Velocial Velocial							+
	VEG : S - I	1.11						+
	Course Costs							+
	المقترين لا يعروها			·				+
	,						<u> </u>	+
	· · · · · · · · · · · · · · · · · · ·							+
	-							

	<u>BLANK AN</u>	<u>ALYSIS</u>	S RESULT	S FOR TARGET COMBOUNTS
FRACTION	TYPE CONC MATRIX	SAMPLE #	SOURCE OF H20	
くつか	LAD BIMIL Aruzous	MBLIKE 12A		18 m 100+harbon 11 mm. 13,4 mm. 15/1/5/1/5/1/5/1/5/1/5/1/5/1/5/1/5/1/5/
VOR	LAB Blank Aduence	1311/6/5		10 of Methoders Chlorise 115 (91)/54 11 of Method 6.8 (140/5) 10 of Method 4.0 (140/5) 11 of Method 4.0 (140/5)
	•	·	JAB.	(Red)
VOA	Mothed BLANK Aguenus	159621	हास्त्री विक्रिय	137 manning Chloring 5.8 19(0)/5(1) 22m. Acethro (n.U (19/0)/5(1) 3.2% (NEIL (7-Puttinge) 1.9 (19/2)/5(1)
VOA	Field Blank	C4493 Vic9:22		Tien Mothingre Optimise (C) Sidiffel (Sta) 15 of Licetone NDB (Ska) 7.578 INFK (2-Siderone) NDB (Ska)
AOV	A RUCCUS	nbrikgi>H	Pecult	Pire Methodene Chioride 54 17(15/19/0) Pine Acetore 4.1 190/ 5(15/1 Pine Nielel 2-Biddings) 3.8110/5 (15/1) USK Viny Aretale 57175/7 (15/1
			<u>(</u> ():	The Tucherodhylore 3.3(M) 5110
400	LAB Black Aqueous	भवा १३ । हर	riell Fram	Disk 1.1.1-trichlorreitage 013 1/2 (PM) Disk Toluen: 016 1/2 (E) 2.0 of Chloropense nil "/5"
AGV	FIR LOSSIANK AROMOS	टेपम्पउ Vicq४२ २-	SENTER	3.8m Vinyl Accepte 1. 197 1510 Enterior Tolliera 1.5 11 15 11
SAMPLE AN	ALYTICAL DATA SUM	MARY, TENT	ATIVELY IDENTIFIE	TITH THE SAMPLE DATA IN A TABULATION FORM WITHIN DECOMPOUNDS IN BLANKS ARE LISTED ON A SEPARATE
				STICS, CHROMATOGRAM AND/OR SPECTRA.

BLANK ANALYSIS RESULTS FOR TARGET COMPOUNDS FRACTION TYPE CONC MATRIX SAMPLE # SOURCE OF H20 CONTAMINANTS (CONCENTRATION OF CELLAN LIMIT (Red) 13/c/ LAB BINGE lective. YINY Ard p.C. いいに行 OFNEPRECDETON QUINLIST ريفه بالمستهام منت (0) 八の子 ARURUS 1.= . 2 - Hernon : 1 Fall 11.0 Tr 2.8 cu Ethyl Benzar richlororing se LAB BLANK VBLK-(c12C VCA Tolerne 6 ARUROUS 4.0 1% 411-AKHLOS BLANK VINUI HERAN-C 99,9 /F3/ 333.64 AOV dibna Toluene Aavenus LABORATORY REPORTED FIELD BLANK DATA IS COMPARED WITH THE SAMPLE DATA IN A TABULATION FORM WITHIN SAMPLE ANALYTICAL DATA SUMMARY, TENTATIVELY IDENTIFIED COMPOUNDS IN BLANKS ARE LISTED ON A SEPARATE **COMMENTS:** (1) RESULT REPORTED BY LABORATORY AND CONFIRMED BY REVIEWER. (2) RESULT INFERRED FROM QUANTITATION LIST, DIAGNOSTICS, CHROMATOGRAM AND/OR SPECTRA. ~

BLANK ANALYSIS RESULTS FOR TENTATIVELY IDENTIFIED ON SUNDS

SAMPLE #	FRACTION	ACTION SCAN	SPECTRUM MATCH INDICES			M ES	BLANK ANALYSES ARE LISTED BELOW:		
			TYPE	SCORE	TYPE	SCORE		(11.	
			1			<u> </u>			
(<u>Un63</u>	MOR						No interpretation	1571110	
(1:1:2)					<u></u> _				
					<u></u>				
C 107:21	AOV						No tem Ative	LL Fourit	
			1		_				
						 			
100000	1/22		1			 	10010	N. N. In D	
(<u>NS) (NH</u>	YOR		╂╼╼╌┼				1/0 tentuario) Noteh)	
181110C]]				NO SUBSTITUTES	Lost included - ocial c scarch of these 3	
YRIVSON	•		<u> </u>				NO tentatur	e scarce of these ?	
							Blanks	·	
<u> </u>						,			
							- 1 :		
				•		Į	<u> </u>	•	
			 						
 			l 				. — — — — — — — — — — — — — — — — — — —		
			╂━╌┼						
 			 		- :			<u> </u>	
 							•		
<u></u>			-						
<u></u>									
				-					
		-					····		
 									
 			╁┷		 -			· · · · · · · · · · · · · · · · · · ·	
									
									
					{				
			<u> </u>						
LL			L	L					
			\Box						
 			-	-	- 				
 			 -						
			 	 }		 -}			
—							<u>:</u>		
					<u>}</u>	1	· · · · · · · · · · · · · · · · · · ·		
)	3]	}	}	1			

WATER SURROGATE PERCENT RECOVERY SUMMARY

CASE NO. 2873 LOW LEVEL WATER QC REPORT NO.	CONTRACTOR ERG. INC. MED. LEVEL	CONTRACT NO. 68-01-6867 HIGH LEVEL OTHER (specify)
[Volatile][Semi-Volatile]-[Pesticide-]-[-

			·									
į					WATER	SURROGATE P	ERCENT RECO	VERY SUMMAR	RY			
	CASE LOW Wate QC R	NO. 2 LEVEL R EPORT NO.	873 >		CONTRA MED. L	CTOR E EVEL	RG.INC		HIG	TRACT NO H LEVEL_ ER (specify)	<u></u>
	SHO			D4-1,2-	D ₅ -		D14-			2,4,6-	-[Pesticide-]- Dibutyl-	
1	Traffic Report No.	D ₈ Toluene (86-119)	8FB (85- 121)	Dichloro- ethane (77-120)		2-Fluoro- biphenyl (44-119)	phenyl	D ₅ – Phenol (15-96)	phenol	Tribromo- phenoi (20-105)	Giloren- date (67-114)**	1,2,3,4- TCDD (23-148)
A 14	C4490	137.1 *	100.8	111.4								
I] - -	C4492 B	130.2 *	93.1	102.6 87.3 96.0								
	<u>C44920LK</u> <u>C4493</u> C7083	151.8 * 165.6 * 154.9 *		119.0 122.8 * 110.6								
	<u>C 7094</u> C 7095	109.7	99.0 79.2 *	23.1 *								
Contract	C7087	142.2 *	101.2	112.8								
*****	ABTKG13C ABTKG13V	134.4_*	87.9	123.7 *								
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	ABTKFITH	137.1 *	91.0	114./								

*Asterisked values are outside of QC limits

**Advisory Limit

Comments: TOTAL OF NINE WATER SAMPLES - VOA ONLY. APPLICABLE . NA . MOT

Volatiles: Semi-Volatiles: Pesticides:

Dioxin:

outside of QC limits out of NA; outside of QC limits out of NA; outside of QC limits out of NA; outside of QC limits

Limits Revised 12/83

..ATRIX SPIKE DUPLICATE/RECOVERY

CASE NO. 2873 CONTRACTOR ERG. INC. CONTRACT NO. 68-01-6 LOW LEVEL HED. LEVEL HIGH LEVEL WATER SOIL/SED. OTHER (Specify)	
WATER SOIL/SED. OTHER (Specify)	
QC REPORT NO. UNITS (Circle) ug/kg	(ug/L)

	1	COHC. SPIKE	COHC.	6	CONC.	6		J	QC TRECOVE	RY LIHITS*	
FRACTION	сонроина	ADDED	HS	REC.	HSD	REC	RPD	RPD	WATER	S011.	COMMENTS
	1,1-Dichloroethylene	26.1	72	276 ×	49	188 *	38 ×	(157	61-145	59-177	1
AOA	Trichloroethylene	25.0	90	3L0 *	C				71-120	62-137	COMMENT (
SHO #	Chlorobenzene	25.0	34	136 *	36	144 *	6	(15%	75-130	60-133	1
C 4492	Toluene	25.0	27	108	27	116	7	(15%	76-125	59-139	
	Benzene	25.0	36	144 *	40	160*	10	(15%	76-127	66-142	1
	1,2,4-Trichlorobenzene					ļ —		COX	39- 98	38-107	1
B/H	Acenaphthene							<5 0X	46-118	31-137	
SHO #	2,4-Dinitrotoluene							(5 0X	24- 96	28- 89	1
	Di-H-Butylphthalate					Ţ		<5 0X	111-117	29-135	1
	Pyrene			ļ		Ĭ		<5 OX	26-127	35-142	
	N-Nitrosodi-N-Propylamine							COOX	41-116	41-126	
_	1,4-Dichiorobenzene		Ţ			1		300	36- 97	28-104	
	Pentachlorophenol							<40X	9-103	17-109	
ACID	Phenol							<4 OX	12- 89	26- 90	
8H0 #	2-Chlorophenol			1				<40x	27-123	25-102	1
	P-Chlor-H-Creaol		ļ	<u> </u>		T		<4 0X	23- 97	26-103	l
· 	4-Nitrophenol					1		<40X	10-80	11-114	
	Lindane		1	1		1		<40%	56-123	46-127	1
PEST	lleptachlor	ļ		ļ	,	1		<40X	40-131	35-130	
SHO /	Aldrin							<40x	40-120	34-132	
	Dieldrin]		<40x	52-126	31-134	
	Endrin			<u> </u>		<u> </u>	<u> </u>	<40x	56-121	42-139	
l	P.P-DDT	T				1]	<40X	38-127	23-134	

^{*}Auterisked values are outside QC limits.

BAOV outside of QC limits out of 5; outside QC limits RECOVERY: out of RPD: BAOV MA; outside of QC limits out of NA; outside QC limits out of B/H NA ACID NA out of outside of QC that & out of NA; outside QC limits ACLD NA; outside of QC 11m/8 x NA out of NA; outside QC limits PEST out of

*Advisory Limits-Revised 12/83

O ZERO REZOVERY IN MSD IN DUE TO SAMPLE AMOUNT BEING LARGER THEN AMOUNT ROUND IN MSD .

DUPLICATE ANALYSIS RESULTS 🕟 🕟

					 	00.
CUPLICATE (SAME/SMAC)	TYPE Same		(UU37M	(4197 NST		180-191
SAMPLEN	10:3	_ il L				
FIELD DUPLTO		· ·	4			
LAB OUPLICA	ATE .	1	#			
SAMPLE LAM	48,KII		Hilly Sofeen	Ve Secretar		
TYPE SOLV	बराव	Ņ	Acuenus	AGUROS	1.	
Fraction		H	11CA	1 6A 1		

The relative percent difference (RPD) for each parameter group was evaluated. The duplicate analysis RPD acceptance criteria should be:

	. Haximum Acceptable
Fraction	Percent Difference
Volatile	15%
Base/Neutral	50%
Acid	4C%
Pesticides	40%

The RPDs exceeding the maximum acceptable percent difference were:

	ding the maximum scce					SPKT/	ari son	Solke Termij	
Fraction	Compound		Actual RPD		Sample	CONC.	SAMPLE		נאט
VOA - Cyyqo MS	1.1-1. Almacit is	(41-145)	30	775	276%	Jul/47.	. Char	27/49	و٧١
	to rejuly salingles	· (71-120)	200	N/S	360%		160 %	٥١/٥	1
	Chlorobers are	(75-125)	(c	ጉሎ	136%	25/34	mSD "	35/21.	
•	PICHTON-C	(76-127)	10	~~~	1441	25/46	INCL.	?5/4°	V.
						7			

<u> </u>		-	<u> </u>			<u> </u>			
									
								<u> </u>	
		_ <u>-</u>	· · · · · · · · · · · · · · · · · · ·						
				 _		<u> </u>		<u> </u>	
								<u> </u>	
<u></u>		_				()			
<u> </u>					-				
•		_							
•									
								1	
								Ì	
				 _		ļļ			
nments: 11-There's	10000000000 +21	r h loanet	humber 1	<u>ากเกิ</u>	(α)				
nments: 1,1-Their	in: Ch492 ,5=	e Note	IN TAR NUL	r 41 + 100	و,		Ì	,	
						<u></u>			

TARGET COMPOUND MATCHING QUALITY

SAMPLE #	FRACTION	SCAN #(S) OB/EXP	MATCH TYPE ISCORE	TRUM INDIC	ES	CONCENTRATION NAME	4EN
Time.	700	<u> </u>				1100 1011 (1100 1100 1100 1100 1100 11	
-4430	VOA			<u> </u>		NDB (NAMICK CHORILE)	
		<u> </u>				NDA Accomo & No example	
		·	 			NDB MEK Includes	
_		<u> </u>				NOB VINL ACETAL /	•
			<u> </u>	1			
CHUAI	VOA		<u> </u>			INDB methodere Horlog No sacr	_
		<u> </u>				NDB MELL Sinclused	
· .	154.8		 				7
C4492	AOU	<u> </u>	 	<u> </u>		NOB myhilus Whiniers NA Spec	
			<u> </u>			NDB MERY I MCL'UD	<u>्रे</u>
		37Ce	11			(019/L) VINVI Acetate	
			<u> </u>			Theirest spectra no milette presen	
						links is parent in or vival acetate (the	<u>د ۲</u>
						Sec Supposed Documents	
		469				1(2,749/L) 1,2 Dichlorothance	
						Dresent ON QUAN LIST, NO STE	2**
						Included, Detertion Limit 1840 (115)	
	·						_
Cuuas	VOA					NDB FERTONE > No solcten	
						NDB INE C ? Inclined	
1							
27083	VOA		 			NDS 100 HOLLER BALLET 42 NO Spec	<u>+</u>
						NDB MEK 3 Enclus	_
7024	VOA					NDB methologicallandez no specta,	$\overline{\mathbf{x}}$
	•	253	1		.]	NDB : TC'AMMIN DISULFINE > I Notwork	
			 			WHAT SLANK IS OSZ IN ? REVIEWER CH	
						FIRST THAT BLANK-NOT ON QUAN	
					i	C IND	
		380	 			(312/L) 1,2-Dichlemethane	
		<u> </u>		· ·		FAIR MATCH BUT other lang proc	<u></u>
·		····	 			COCLUMS WITH Cally 3 - Noter to	<u>, , , , , , , , , , , , , , , , , , , </u>
			 	-		LAB AS CICKEN CONTAININGT	
			 -			Took match when eliminate Caclat	
						MAGNITUDE CONTRACTOR ATLANT 12-DICKHAR	<u>ازار</u> ماحد
<u> </u>			 	 -		THE THE GREET THE TOTAL CHANGE	<u> </u>
7065	VCF	!	 		}	MODIFIC VINI Acetate - Alex long -	
J 76.86 3	V. F		 			TONE THE VINIT PRESENT AT LONG TO	<u> 4 ''</u>
			 			See Supprist Decoments ,	_
-: ,-,	15 Co					SIDE MANY CONTRACTOR THE CONTRACTOR	
1480	7 121		├──├ ──┤			NDR MAKELLING THE 2 NO SOCOT.	-12
·			╂╼╌┼			17-13 MERC SINCLULAR	
こうとこ	119 +-		 			MB Methanic Chlorine	
			 			nue INEIC (No Coe	
			/	160 .		1174 trichlorosticulona. > No Bla	
			-/-	771		176 Ill-tricklor techanic Last 3	
				<u>Ş</u>		1779 11-Dichlorn-thore Why we	121
				ا ز3		1738 1,1-Diribirathyline 1 they	<u> </u>
				$-L\Pi$	5/	Vie trans-12-10 in months is the	

TENTATIVELY IDENTIFIED COMPOUND SAMPLE RE

ALL TENTATIVE IDENTIFICATIONS OF CONFIDENT MATCHING QUALITY, WHICH AREN'T SUSPECTED ARTIFACTS/CONTAMINANTS, ARE LISTED BELOW:

SAMPLE #	FRACTION	SCAN #(S)	TYPE	SPE(ATCH ISCORE	INDIC	M CES ISCORE	ESTIMATED CONCENTRATION	COMPOUND NAME	COMMENT
7-06-1	VOR	13-0	12	- <th></th> <th>354</th> <th>しらいだん)のから</th> <th>air is lim nothere</th> <th>UCZCIFA)</th>		354	しらいだん)のから	air is lim nothere	UCZCIFA)
					1	•	CAR	Match	
	•		T				<i>(</i> *		
		100 ×	ì	:: इप	F	-	122 P/() 2-BU	up yo	
		,	Ī			;	Angre 4 het 1	hic is a curry	HARTOCARE
	_		T	T			かみ つうころ もみ	Slik BC 3"D	choice
	-						1-Buttene (pu	114 74 / 20 ZRI	Policie
		· · · · · · · · · · · · · · · · · · ·	1	1			3-methue-1-pr	ירצונב (שיון ואניאי	(2)
			1				y		
		372	1			1	1)NK MOWN	-	
					\Box				
7181	ANV	400					DATENOUS		
	•						<u> </u>		-
		(2710	17	178	=	160	いいっていいしことの	inct he coonten	(CeHII)
•				T			class but her a	CAC+CBECTILA	MATCH
					T		Arroe this is	oroprobly Cet	IL Alishatic
			1	·			FLKERR. but me	us to ANOTher	Konel
Î									
			 						
			1		!				
									-
									•
			1						
			 						
i									
 j	· · · · · · · · · · · · · · · · · · ·		<u> </u>						*
-									· · · · · · · · · · · · · · · · · · ·
			1						
			i					· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
							•		
	1								
								•	
				i					
									_
	· · · · · · · · · · · · · · · · · · ·						· · · <u> </u>		
	· · · · · · · · · · · · · · · · · · ·								
1									
							4		
									
					1				

•	
	QUANTITATIVE CALCULATIONS NAL
•	CALCULATION ERRORS AND CORRECTED RESULTS ARE LISTED BELOW ((cod)
	Med No.
	Chloroform ºlaD CAlculation Std V1009 GIRC
	RF=0.9(0 RF=1.005
	0/10 = TEX-14 = 1.005-11.00 = 2.49%
	Reported 2017 in winder Decimal spel coentral
-/5	
(3)	
	All Detection Limits Should be pleased (XS)
	All Detection Limits Should be devated (X5)
•	
	·
	i i
	·



APPENDIX D



Ų.S.	ENVIRONMENTAL PROTECTION AGENCY - CLP Sumple Management Offici	3
F.O.	Box 818, Alexandria, Virginia 22313 - 703/557-2490	

.0. 60	f efel United	M. M. A. S. M. 27313 - 1931331 4	*4*7 Q	C 4490	
			ORGANICS ANALY	I VSIC MATA CHEST	
-900t#	tory Names ,			Case Not	
ندی هما	mpie ID Not ,	06/1096	16	QC Report No:	
iempie	Matrixs	WATER		Contract No.s 62-01-6367	
ace R	eleese Author	rized Bys 724/Es	cere-	Date Sample Received: 17 34	
				PESTICIDES (BY GC)	
CON	CENTE ATTO	MI (LOW) MEDIUM HIGH ICH	scie soul	CONCENTRATION: LOW MEDIUM HIGH (circle one)	
		D/PREPARED:	-	DATE EXTRACTED/PREPARED:	
	E ANALYZE	1		DATE ANALYZEDI	_
	ENT MOIST		NA	PERCENT MOISTURES	_
	C-/DILUTION	· - 	NA	CONCJUILUTION FACTOR:	_
					-
			(ug/1) er Gg/fag	we/i	_
PP #	CAS		(circle one)	PP CAS / (circle or	'n
(24)	107-02-8	ecrolein	100 U	(89P) 309-00-2 sidein NA	
(34)	107-13-1	acrylonitrile	100 U	(50P) 60-37-1 dieldrin	•
(44)	71-43-2	bedzene	5 U	(91P) 57-74-9 chlordane	
(6V)	36-23-3	Carbon retrachloride	5 U	(97P) 50-29-3 *.4'-DDT	
(74)	108-90-7	chlorobenzene	5 0	(93P) 77-99-9 4,4'-DOE	
(TOA)	107-06-1	1,2-dichipreeshane	1 ((96P) 72-36-4 1,V-DDD	
(117)	71-33-4	. . -trichloreethane	5 U	(95P) 115-29-7 ≪ -endocultan	
(IJA)	75-34-3	(,l-dichiorvethane	5 U	(96P) 113-29-7 B -endoquitan	
(1+V)	79-00-3	1,1,7-trichlorsethane	5 U	(979) 1031-07-6 endomiten militate	
\$3 \$)	79-34-5	i.i.2.7-tetrachieraethane	10 U	(989) 71-20-4 undrin	
147)	73-00-3	chierestrene	10 U	(999) 7621-93-6 endrin Aldehyde	
(5 V)	110-72-8	2-chloroethylvinyl ether	10 U	(100P) 76-64-8 heptachilor	
277)	67-64-3	chlorotorm	5 U	(1017) 1024-37-3 heptachlor epenide	
274)	75-35-4	i,i-dichtereethene	5 U	(103P) 319-86-6 <-8HC	
30Y)	134-60-3	trans-1,2-dichloreethene	5 U	(103P) 119-85-7 A -8HC	
<u> </u>	71-17-3	1,2-dichioropropens	10 U	(104P) 319-86-8 & -BHC	
	(0061-02-4	trans-1,3-dichlorograpene	<u>5 U</u>	(105P) 58-69-9 7-BHC (lindeng)	
	0061-01-03	cis-i_3-dichieropropene	5 g	((GEP) 53469-21-9 PCB-1242	
)1Y)	100-41-4	ethy bensene-		(107P) 11097-69-1 PCB-1254	
aay)	79-09-2	methylene chieride	ND B		
4,54)	74-87-3	chibromethane	10 U	(1099) (1141-16-5 PCB-1232	
44Y)	74-43-9	bromomethane	10 U	(110P) 12673-29-6 PCS-1246	
47V)	73-23-2	<u>brometerm</u>		(111P) (1096-82-3 PCB-1260	
44V)	7,-27-4	bromodichioremethane	5 u	(L1ZP) 12674-11-2 PCB-1016	
49V)	75-49-4	![uoretrichleremethene		(113P) 1001-33-2 taxaphene	
59Y)_	77-71-8	<u>dictrioredillusremethene</u>			
21.4)	121-42-1	Chloroelbromomerhane		·	
85V)	127-18-4	tetrachioroethene	5 <u>ป</u>	DIOXINS	
14V)	108-88-3	talvane	- 5 U	CONCENTRATION: LOW MEDIUM HIGH (circle one)	
17Y)	79-01-6	trichlersethene		DATE EXTRACTED/PREPAREDI	_
(AA)	75-01-5	visyi chieries	ND B	DATE ANALYZED:	_
	67-64-1	acetone		PERCENT MOISTURES	_
	78-93-3	Z-butanene	NO B	CONCJUILUTION FACTOR	-
	73-13-0	carbondisullide	<u> </u>		
	319-78-6	2-hexanene	5 U	or unfine	[,
	108-10-1	4-methyl-2-pentanene	3 <u>U</u>	PP# CAS# (circle on (1298) 1746-01-6 2,3,7,5-tetrachlorodibenzo-p-dioxin NA	
	TOD-DE-)	STYTERS		(1479) [/-e=01-e (,J,/,B-(@CBCHOFQUDB-R9-P-010XU ///	

U - Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

K - Actual value, within the limitations of this method, is less than the value given.

CX - Compounds which were concentrated by a factor of 10 times.

B - Blank > 1/2 method 0.L. and > 1/2 conc. in sample. Report ND B

C - Blank > 1/2 method 0.L. and < 1/2 conc. in sample. Report (corrected conc.) C

101-03-4

vinyi ecetate 1330-20-7 total sylenes

U.S. ENVIRONMENTAL PROTECTION AGENCY - CLF Sumple Management Office P.O. Sox E18, Alexandria, Virginia 22313 - 703/597-2490

			*****************************	C 7771	
		ERG.INC.	ORGANICS ANALYS	2 4 67 7	
	tory Names		7.0	Case No:	
	mple ID Not	WATER	911		
•	Matrix				
DAGE K	elease Autho	· 	alesse.	Dase Semple Received:	
		VOCATILES		PESTICIDES (BY GC)	
CON	CENTRATIO	NI LOW MEDIUM HIGH	(circle one)	CONCENTRATION: LOW MEDIUM HIGH (curcle one)	
		ED/PREPAREDI	NA.	DATE EXTRACTED/PREPARED	
DAT	E ANALYZEI	0. 6/12/9	74	DATE ANALYZEDI	
	CENT MOIST		NA	PERCENT MOISTURE:	
CON	C./DILUTION	FACTOR:	NA	CONC./DILUTION FACTORS	
					•
			er Opprio	ug.	
PP#	CASS	•	(circle one)	PP CAS P (circle	
(2V)	107-02-8	acrolein	100 n	(89P) 309-00-7 aldrin	ιÀ
(JV)	107-13-1	acrylonitrile	100 0	(90P) 60-57-1 dieldrin	
(4V)	71-43-2	benzene	5 U	(9LP) 17-74-9 chlordane	í
(6V)	3 4- 83-3	carbon terrachtoride	5"0	(92F) 20-29-) 5,V-DOT	
(7 V)	108-90-7	chloropenzene	5 U	(93P) 72-53-9 4,4-ODE	
(TOA)	107-04-2	1,2-dichieresthane	1 U	(94P) 72-94-8 4,4'-DDD	I
(IIA)	71-35-4	l.l.l-trichloroethene	\$ U	(93P) 113-29-7 << endosultan	
(13V)	75-34-3	(,)-dichloroethane	5 U	(94P) 113-29-7 B -endesuitan	
(100)	79-00-3	1,1,2-trichloreethane	<u>5 U</u>	(979) 1031-07-3 endesultan sultate	
(134)	79-34-5	1.1.2.2-terrechloroethene		(98P) 72-20-8 endrin	i i
(16V)	73-00-3	chleresthere	10 U	(999) 7421-93-4 endrin aldehyde	
(174)	119-75-8	2-chieraethylvinyl ether	10 0	((00P) 76-44-6 heatschior	ļ
(2)()	67-66-)	chioroform	<u> </u>	(101P) 1024-57-3 heptachlor epaxide	
(29V)	75-15-4	I, I -dichloroethene	<u> </u>	(1029) 119-84-6 < SHC	
(30V)	136-60-3	trans-1,2-dichloroethene	5 U	(103P) 319-45-7 A -BHC	1
(35A)	79-17-5	1,2-dichioropropane	TO A	(1048) 119-46-1 8 -BHC	i
(33A)	10061-02-6	17209-1,3-dichloropropane		(165P) 38-69-9 7-8HC (lindane)	!
	10041-01-05	cis-I,)-dichieropropene	<u>5 y</u>	(106P) 33449-21-9 PCB-1242	l I
(35V)	[00-4[-4	ethyibenzene		(107P) 1097-49-1 PCB-1254	ı
(44V)	75-01-2	methylene chloride	ND B	(108P) 11104-28-2 PCB-1221	ı
(45V)	74-47-3	chleromethene	10 u	(109P) (114(-16-5 PCB-1232	
(964)	74-43-9	promometrane	10 U	(110P) 12672-29-4 PCB-1208	
(47V)	75-25-2	bromotorm	10 0	(111P) 11096-42-5 PCB-1260	·
(44Y)	73-27-4	bromesichleremeshane	5 <u>u</u>	(112P) 12676-11-2 PCB-1016	,
(45V)	73-49-4	(lugratrich/gromethane	10 U	(((3P) 400(-15-2 texaphene	
(50Y)	73-71-4	<u>dichioredidiyoremethane</u>			
(314)	124-48-1	chloredibrememethene	10 0		
(834)	17-18-4	retrachiorgethene	5 <u>U</u>	SARXOIG	
(\$6V)	[QE-44-3	toluene	5 U	CONCENTRATION: LOW MEDIUM HIGH (circle one)	
(87Y)	79-01-6	Trichloroethene		DATE EXTRACTED/PREPARED:	
(224)	73-01-3	viny) chleride	10 U	DATE ANALYZED:	
	67-44-1	_ecertains		PERCENT MOISTURE:	
	73-93-3	2-butariene	ND B	CONC./DILUTION FACTOR:	
	75-15-0	carbondisulfide		· · · · · · · · · · · · · · · · · · ·	/1
	319-71-6	2-hexamone	5 U	er üz	/Ng
	108-10-1	4-methyl-2-pentanone	5 U	PP 6 CAS 6 circle (1298) 1785-01-6 2.3.2 Asserts chlorodibenta envision N	one)
	00-42-5	JEYFERE		(1298) 1746-01-6 2,3,7,1-tetrschlorodibenzo-p-dioxin V	
	108-05-4	viny) acetate	<u> </u>		
	1330-20-7	total xylenes	5 U	December	LS.

- U Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

 K Actual value, within the limitations of this method, is less than the value given.

 CX Compounds which were concentrated by a factor of 10 times.

 B Blank > 1/2 method D.L. and > 1/2 conc. in sample. Report ND B

 C Blank > 1/2 method D.L. and < 1/2 conc. in sample. Report (corrected conc.) C



U.S. ENVIRONMENTAL PROTECTION AGENCY - CLP Sample Management Office P.O. Box 513, Alexandria, Virginia 22313 - 703/557-2490

				C 4492
		ERG. INC.	ORGANICS ANALYS	3477
Laboratory	-		1	
Lab Sample			1613	QC Report Not
Sample Ma	_	WATER	· / · · ·	Contract No.: 68-01-6369
Data Relet	Me Author	used By:	taitess.	Date Sample Received: 67784
		VOLATELES		PESTICIDES (BY GC)
CONCE	NTRATIOS	LOW MEDIUM HIGH	(circle one)	CONCENTRATION: LOW MEDIUM HIGH (circle one)
		D/PREPARED:	NA	DATE EXTRACTED/PREPARED:
	NALYZED		4	DATE ANALYZED:
	IT MOUSTL		NA	PERCENT MOISTURE:
		FACTOR:	NA	CONC./DILUTION FACTOR:
COITCH	- III-1	THE PARTY NAMED IN COLUMN TO THE PARTY NAMED		CORE JOILS HON PACTORS
			or old in	ug/L
PP #	CASA		(circle one)	PP# CAS# (Circle on
(2V)	107-02-8	acrelein	100 U	(\$9P) 309-00-2 aldrin N A
(JV)	107-13-i	acrylonitrile	100 U	(90P) 60-37-1 digidrin
(4V)	71-43-2	benzene	5 U	(91P) 37-74-9 chlordene
(6V)	16-23-1	carbon tetrachloride	5 U	(92P) 10-29-3 4,4'-DDT
	108-90-7	chlorobenzene	5 U	(91P) 72-15-9 4,4-DDE
	107-06-2	1,2-dichloroethane	1 0	(90P) 72-36-8 6,61-DDD
(117)	71-35-6	[_]_l-trichleresthane	1400.0	(99P) (13-29-7 (C -endeculfan
(13V)	75-39-3	(,)-dichlorosthane	9.0	(969) 115-29-7 A -endesultan
(10A)	79-00-5	(,1,2-grichloroethane	5 Ü	(977) 1035-07-8 enderuitan suifate
(13V)	79-34-5	1.1.2.2-tetrachioroephane	10 U	(98P) 72-20-8 engrin
(16V)	75-00-3	crioreethane	10 V	(999) 742[-93-b endrin aldehyde
	110-75-4	2-chlaraethylvinyj ether	ĩã Ú	(100P) 76-44-8 negtachlor
(23V)	67-46-3	chlore/orm	5 U	(101P) 1020-37-3 heptachlor eposude
(29V)	75-35-4	I,I-dichiarvethene	130.0	(102F) 319-84-6 <-8HC
	156-60-5	trans-1,2-dichloroethene	150.0	(103P) 319-43-7 B-BHC
(327)	78-47-3	1,2-dichlereprepane	10 U	(100P) 319-86-8 S -8MC
	361-02-6	trans-1,3-dichioropropene	5 Ū	(105P) 38-89-9 7'-SHC (tindene)
	1-01-05	cis-1,3-dichioropropene	5 11	(106P) 53049-21-9 PCB-1202
	100-1-4		<u>5</u> Ü	(107P) 11097-49-1 PC8-1234
(84V)	75-09-2	estryibenzene mestryiene chieride	ND B	(108P) 11104-28-2 PC8-1221
(45V)	76-47-1	Chioremethene	10 U	(109P)
(44Y)	74-13-9	prememerations	10 U	(110P) 12677-29-6 PCB-1248
	75-25-2		<u> </u>	
(95Y)		bremetern	5 (1	(111P) 11096-82-3 PCB-1260
	<u>75-27-4</u> 75-49-4	Ingrestrichieremethane	10 U	(1139) 12676-11-2 PCB-1016 (1139) 8001-35-2 texaphone
	73-71-8		10 0	(113P) \$001-35-2 tottaphane
	20-48-1	dichlorediffueremethane	iou	
	27-18-4	chlorodibromomerhene tetrachloroethene	8.0	DIOXINS
(87Y)	<u>(08-88-)</u> 29-01-6	talvane	026.00	CONCENTRATION: LOW MEDIUM HIGH (circle one)
	73-01-4	trichleresthens at	10 K	DATE EXTRACTED/FREPARED:
	67-64-1		5 0	DATE ANALYZED:
	72-93-3	2-bytanene	ND B	PERCENT MOSTURE
	73-13-0	carbandinulfide	7 0	CONC./DILLITION PACTOR:
	/3-13-0 15-78-4		<u> </u>	ug/1
		2-hestanone	5 (1	er ug/kg PP # CAS # (circle one)
	08-10-1	4-methyl-2-pentanane	5 U	(1298) 1746-01-6 2,3,7,8-tetrachteredibenze-e-diezin N.A.
	00-42-3	styrene	6.0	(1470) (/(
	08-05-4 30-20-7	viny) scette	5 U	December 1933
	JU-40-/	total xylenes		December 17-3

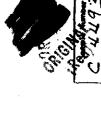
 θ - Compound was analyzed for but not determine T - number is the minimum attainable compound was analyzed for but not detected to industry the sample.

K - Actual value, within the limitations of this method, is less than the value given.

CX - Compounds which were concentrated by a factor of 10 times.

B - Blank > 1/2 method B.L. and > 1/2 conc. in sample. Report NO 8

C - Blank > 1/2 method D.L. and < 1/2 conc. in sample. Report (corrected conc.) C



1111

ORGANICS ANALYSIS DATA SHEET U.S. ENVIRONMENTAL PROTECTION ACENCY - CLP Sample Manager P.O. Box 813, Alexandria, Virginia 22313 - 703/557-2990

CONCENTRATION: LOW MEDIUM HIGH (circle me) 2873). (9 Date Sample Receiveds OC Report No. Contract No. Case Non 689.100 06 10 WATER 0 Sample Matrixis WA Lab Sample ID Nor Laboratory Names

-6369

õ

PESTICIDES (BY GC)

NA NA A HICH (curcle one) 12/ MEDIUM DATE EXTRACTED/PREFARED:
DATE ANALYZED:
PERCENT MOISTURE:
CONC./DILUTION FACTOR: CONCENTRATION

DATE EXTRACTED/PREPARED: DATE ANALYZED: PERCENT MOISTURE:

CONCJUILUTION PACTOR

	3	100	S	n T	5 0	_	S 0	2	2	ŀ) 0 0 1 0	n 01	2	2	5 C	70 C	5 U	D C	- 1	8.8 C	10 D	⊃ 01	10 C	-2	10 n	01	01			- 1	10 C	S)	_[- -	2 0	3 5	⊃ 	S.	∵
	acrolein	acrylonitrile	benzene	carbon terrachloride	Chlorobenzene	1,2-dichieresment	i.i.i-trichloroethere	1.1-dichiarosthene	1,1,2-trichieroethane	Li.2.2-terrachiereschere	chieraethare	2-chieroschylvinyi ether	chierotorm	1,1-dichlorpethene	trans-1,2-dichloroethene	1.2-dichloropropent	trans-i, 1-dichioropropens	cis-(")-dichleropropene	ethylbengene	methylene chloride	chlaremethane	bremenstere	trametern	brymedichigromethany	Pueretrichleromethene	dichiarodiffueromethere	chlerodibrymomethane	terechloresthere	toluene	trakertere	veryl chloride	Acres	2-butanene	carbendiavidide	2-hesterne	4-methyl-2-pentanone	ITTOTAL	vinyi acetate	- 8
3	1-20-70	107-13-1	71-43-2	56-23-5	108-90-7	107-06-2	71-32-6	75.30.3	79-00-5	14.47	7,585.1	110-72-8	(7-44-)	75.354	156-60-5	78-87-3	10061-02-6	10061-01-09	4-14-001	73-09-2	7-17-3	6487	75.15-2	15.77.4	12.62.	25.71-4	1345	12-21	1981	7.41.4	79-01-4	1-49-25	72.92.3	75.13-0	319.72.6	108-10-1	100-2-5	105-05	1 10.20.7
È	3	ŝ	3	(6)	٤	<u>§</u>	3	3	3	3	3	틸	ã	8	Š	S	3		3	À	3	5	ξ	3	E	8	딁	3	흴	B	9					ļ	-	١	i

מי שני/ו מי שני/ון (כורכופ מחפי) - NA (999) 7021-93-4 entrin aldentes Metachior spe M-SHC A-SHC (105P) 315-6-8 S-6HC (105P) 35-65-3 T-8HC (1106 (105P) 35-65-31-9 PCB-1282 (107P) (1097-45-1 PCB-125 (104P) 11106-25-2 PCB-1221 Per carifor PCB-1260 PCB-1016 77-56-6 6-4-DOD (1099) 11141-16-3 PCB-1232 (1109) 12672-29-6 PCB-1244 (1137) 1267-11-2 F (1137) 1267-11-2 F (1137) 2001-35-2 v 1.75 19-65-7 17.72.9 30.29-3 72.55-9 60-57-1 3

CONCENTRATION LOW MEDIUM HIGH (circle one) DATE EXTRACTED/PREPARED: DATE ANALYZED: PERCENT MOUTURE. CONC./DILUTION PACTOR CLIPTIC ONE 3 1746-01-6 (1238) È

The number is the minimum attainable not detected.

less than the value given *X&0

detection limit for the sample.
Actual value, within the limitations of this method, is less than the Compounds which were concentrated by a factor of 10 times.
Blank > 1/2 method 0.L. and > 1/2 conc. in sample. Report ND 8
Blank > 1/2 method 0.L. and < 1/2 conc. in sample. Report (corrected

U



U.S. ENVIRONMENTAL PROTECTION ACENCY - CLP Sample Management Office P.O. Box 818, Alexandria, Virgina 22313 - 703/557-2890

	0.0	GANICS ANALY	E)E DATA :	CHRET		<u>C 4083</u>
I sheepless Manag	ERGING,	CHAMICS ANALY.	Case No:		2 1	
Laboratory Names _ Lao Sample ID Nos	00/1096	33	-		0/3	
		~	QC Repor	-	6.02 = 64	-6367
Sample Macrixi	WATER		Contract			
Data Release Author	rized By:	C44	_ Date sew	pie Receiv	·	3-34
	VOCATILES				PESTIC	EDES (BY GC)
CONCENTRATION	W LOW MEDIUM HIGH COPE	ie one)	CONCE	ENTRATIO		UM HIGH (circle one)
DATE EXTRACTE		NA			D/PREPARED	
DATE ANALYZED				ANALYZEI		
PERCENT MOIST		NA		NT MOIST		
CONC./DILUTION		NA			PACTOR	
			44.14.	, 0.40		
		(ma/1)				ug/) er us/kg
PP# CAS#		(circle one)	PP #	CAS #		(circle one)
(2V) 107-02-8	acrolein	100 U	(899)	109-00-2	aldrin	NA
(3V) 107-13-1	acrylonatrile	100 U	(909)	60-57-1	dieldrin	141/
(4V) 71-43-Z	benzene	5 U	(91P)	57-74-9	chlordane	
(6V) 56-23-5	carbon tetrachionide	5 U	(92P)	50-29-3	1.00-V.F	
(7Y) 108-90-7	chierobenzene	5 U	(93#)	72-55-9	4.4'-DDE	
(10V) 107-06-2	1,2-dichloresthane	1 U	(94#)	72-54-6	4,4-00D	
(IIV) 71-35-4	i.i.i-trichloroethane	5 0	(95P)	115-29-7	≪ -enconutian	
(L3V) 75-34-3	, -dichiproethane	5 ป	(96P)	115-29-7	B -endomillan	
(14V) 79-00-5	1,1,2-trichloroethene	5 U	(97P) I	031-07-8	endowifan mili	Ate
(LSV) 79-34-5	[.[.Z.Z-tetrachieroethane	10 U	(98P)	72-20-4	endrin	
(16V) 75-00-1	chieroethane	10 U	(99P) 7	421-93-4	endrin aldehyde	
(19V) 110-75-8	I-chieroethylvinyl ether	10 U	(100P)	76-44-6	heprinchler	
(23V) 67-66-3	chieroterm	5 U	(101P) 1	024-57-3	heptachler eper	cide
(29V) 75-35-4	i,i-dichloroethene	5 U	(IGZP)	319-60-6	⋖ <-BHC	
(30V) 156-60-3	trans-1,2-dichloroethene	5 U	(103P)	319-85-7	A -BHC	
(3ZY) 73-87-5	1,2-dichloropropane	to U	(LOAP)	319-86-6	S-BHC	
(33V) 10061-02-6	trans-1,3-dichlorepropens	5 0	(1059)	58-19-9	7 -BHC (linda	ne)
10041-01-05	cis-1.3-dichloropropene	5 լլ	(1062) 534	169-21-9	PCS-1242	
(384) 100-41-4	ethylbensene	5 U	(107P) 110	397-69-1	PC8-1254	
(MAY) 75-09-2	methylene chloride	ND B	(LOSP) LL	O-28-2	PC8-1221	
(45V) 76-47-3	ch/oremethane	10 υ	(L09P) LL	6-6-5	PCB-1232	
(66V) 76-83-9	bromomeshane	10 0	(LIGP) (26	72-29-4	PC8-1248	
(47V) 73-23-2	bremetorm	10 0	(111P) 110	796-82-7	PC8-1260	
(48V) 75-27-4	bremedichloromethene	5 U	(112P) 120	574-L1-Z	PCB-IQI6	1
(49V) 73-69-4	[lugratricitioremethang	10 8	(1137) 80	201-33-2	toxaphene	· · · · · · · · · · · · · · · · · · ·
(50Y) 75-71-8	dictrioradifluoromethene	10 0				
(314) 124-48-1	chieredibremenethane	ال 10				
(85V) 127-18-4	tetrachieroethene	5 Մ			DIOXINS	
(36Y) 101-13-3	30 Juane	5 U	COMPE	NTH A TION	6 10 0 UE001	IM HIGH (circle one)
(87V) 79-01-4	Tichlerosthene	5 <u>វ</u>	-		D/PREPARED:	a rider (Cicle and)
(\$8V) 75-01-4	vinyt chloride	10 U		NALYZED		
67-44-	agetijne	5 U		TROW TH		
78-93-3	2-butanone	NP B		DILUTION		
75-15-0	carbondisuifide	1 0				
519-78-6	I-hexanone	5 U				ug/1 ar ug/kg
108-10-1	4-methyl-2-pentanone	5 U	PP#	CAS#		(circle one)
100-42-5	STOTEMS	5 U	(1298) 17	46-01-6	2,3,7,8-tetrachic	oradibenzo-p-diaxin NA
108-05-4	vinyl acetate	5 U				
110 70 7		£				December 1481

- U Compound was analyzed for but not detected. The number is the minimum attainable
- detection limit for the sample.

 K Actual value, within the limitations of this method, is less than the value given.

 CX Compounds which were concentrated by a factor of 10 times.

 B Blank > 1/2 method 0.L. and > 1/2 conc. in sample. Report ND B

 C Blank > 1/2 method 0.L. and < 1/2 conc. in sample. Report (corrected conc.) C

U.S. ENVIRONMENTAL PROTECTION AGENCY - CLP Sample Management Office P.O. dox 818, Alexandria, Virginia 22313 - 703/557-2490

		and an Property of the State of					C 709	3.45
		ERG. INC. OR	SANICS ANALY		-	873		4.50
	tory Name:		577	_ Case No		0/3		
	mple ID Not _	06/1096	<i>· •</i>	_ QC Rep		63-01	- (2) 9	
	Matrixi _	WATER	·/·	Contrac				
JACA R	elease Author	rized By:	911	_ Date St	mple Receiv	redi <u>6</u>	7-8	<u> </u>
		VOLATILES				PESTI	CEDES (BY GC)	
CON	CENTRATIO	NE LOW MEDIUM HIGH GETCH	e ane)	CONC	ENTRATIO	N: LOW MED	IUM HIGH (circle	one)
DAT	E EXTRACTE	D PRET ARED	NA			ED/PREPARED		
	E ANALYZED			DATE	ANALYZE	Dı		*
PER	CENT MOIST	JRE:	N.A	PERC	ENT MOIST	URE		
CON	CJOILUTION	FACTOR:	N A	CONC	./DILUTION	FACTOR		
			(F)		,	•		
			20.1					ug/l orug/kg
PP #	CAS #		(curcle one)	PP P	CAS #			(circia oue)
(27)	107-02-8	actulein	100 0	(89P)	309-00-2	aldrin		
(34)	107-13-1	acrylonitrile	100 U	(90P)	60-37-1	dieldrin		INA
(4V)	71-43-2	benzene	<u> 5 U</u>	(919)	<u> </u>	chlordane		
(6V)	56-23-1	cargon tetrachioride		(92P)	50-29-3	s,s'-ODT		_
<u>(7Y)</u>	108-90-7	chlorobenzene	5 U	(93F)	72-55-9	4,4'-008		
(TOA)	107-04-2	1,2-dichloreethane	3.0	(94P)	72-54-8	4,4'-DOD		
(ITA)	71-33-4	1.1.1-trichleroethane 42	00.0	(95P)	115-29-7	≪-endesuiter		
(13A)	75-34-3	1,1-dichloreethane	41.0	(96P)	115-25-7	A -migralian		_
(I+V)	79-00-5	I.1,2-trichleroethane	5 U	(97P)	1031-07-8	endosulfan sul	fate	- I
(15A)	79-34-5	1,1,2,2-tetrachiorpethane	10 U	(98P)	72-20-8	endrin .	- <u></u>	_
(16V)	75-00-3	Chloroethane	10 U	(991)	7 421-93- 4	endrin aldehyd	se	
(f2A)	110-75-8	2-chieroethylvinyl ether	10 U	(1006)	76-44-6	heptachler		-
(23V)	67-64-3	chloreform	<u> 5 K</u>	(101P)	1024-57-3	heptachier epe	oxide	- !
(29V)	75-35-4	1,1-dichlorgethene (a	2.05	(103P)	319-84-6	≪-BHC		
(<u>30V)</u>	1,54-40-5	trans-1.2-dichtoroesnene 3	40.0	(103P)	3(5-83-7	A -BHC		- 1
(327)	78-87-5	1,2-dichloropropare	10 0	(104P)	119-16-8	δ -8HC		_
()) ()	10061-02-6	trans-1,3-dichloropropene	5 U	(103P)	51-19-9	7-8HC (lind	ane)	_
	10061-01-03	cis-1,3-dichieropropene	5 <u>u</u>	(106P) 3	3469-21-9	PC8-1292		 1
(3EV)	100-41-4	ethylbenzene	5 U	(107P) t	1097-69-1	PCB-125#		_
(44V)	75-09-2	methylene chloride	ND B	(108P)	1104-22-2	PCB-1221		_ l
(45V)	74-87-3	chloromethane	10 U	(1099) :	[[4]-16-5	PC3-1237		_
(44V)	74-83-9	bromemethane	10 U	(110P) 1	2672-29-6	PC3-1245		_ 1
(07V)	75-25-2	bromeform	10 U	(1118)	1096-82-5	PCB-1260		_ [
(44V)	73-27->	bremedichieremethane	5 1	(112P) 1	2674-11-2	PC8-1016		_ ↓
(49V)	75-49-4	fluorotrichloromethane	10 U	(113P)	\$001-15-Z	toxospitene-		_ *
(50V)	75-71-8	dichlocodifiusremethene	10 0					
(51V)	[20-02-]	chioredibrememethane	10 U					
(V¢8)	127-18-4	tetrachioroethene	21.0			DIOXIN	5	
86V)	108-84-3	tolyane	6.0	CONC	ENTRATION	e LOW MEDI	UM HIGH (circle (ana)
87Y)	79-01-6	rrichlerestnene 48	00.0			D/PREPARED:		
88Y)	73-01-4	vinyt chleride	10 K		ANALYZED			
	67-44-1	ACETONE	<u>5 K</u>		ENT MOIST			
	78-95-3	2-busanene	5 U		JDILUTION			
	75-15-0	carbondisulfide	ND B	30170				
	519-78-6	2-hexanone	5 U					ug/i ef ug/ke
	108-10-1	(-methyl-2-pentanone	5 U	PF #	CAS#			(circle one)
	100-12-5	/hyreng	5 ป	(1295)	1746-01-6	2,3,7,3-tetraci	niorodibenzo-p-diox	in NA
	108-05-4	vinyl acetate	5 U					
	1330-20-7	total xylenes	5 উ				Dec	emper 1983

U - Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.
 K - Actual value, within the limitations of this method, is less than the value given.
 CX - Compounds which were concentrated by a factor of IO times.
 8 - 81ank > 1/2 method O.L. and > 1/2 conc. in sample. Report NO 8
 C - 81ank > 1/2 method D.L. and ≤ 1/2 conc. in sample. Report (corrected conc.)



U.S. ENVIRONMENTAL PROTECTION AGENCY - CLP Sample Management Office P.O. Box 818. Alexandria, Virginia 22313 - 703/557-2490

ORGANICS ANAL	YSIS DATA SHEET
Laboratory Names ERG. INC.	
Lao Sample 10 Not 06 109625R	QC Report Nos
Sample Marrier WATER	Contract No.s 68-01-6369
Data Release Authorized Bys	Date Sample Received: 6 7 34
	/av. aa\
TOLATERS	PESTICEDES (8Y GC)
CONCENTRATION: (LOW) MEDIUM HIGH (circle one)	CONCENTRATION: LOW MEDIUM HIGH (CIFCLE and)
DATE EXTRACTED/PREPARED: NA	DATE EXTRACTED/PREPARED:
DATE ANALYZED: 6 13 84	DATE ANALYZED:
PERCENT MOISTURE:	PERCENT MOISTURE:
CONC./DILUTION FACTOR:	CONC./DILUTION FACTOR:
	we/1
or taring	or vie/ke
PP# CAS# · (circle one)	PP# CAS# (curcle one)
(2Y) 107-02-8 acrolein 100 U	(89P) 109-00-2 Aldrin
(3V) 107-13-1 acrylenitrile 100 U	(90P) 60-17-1 dieldrin NA
(eV) 7(-63-2 benzene 5 U	(91P) 57-74-9 chierdane
(6V) 16-23-1 carbon tegrachloride 5	(92P) 50-29-3 4,4'-OOT
(7V) 108-90-7 chlorobensene 5 U	(93P) 72-53-9 4,4'-ODE
(10V) 107-04-2 1,2-dichieresthane 1 U	(94P) 72-54-8 4,4'-DDD
(LIV) 71-55-6 (.1.1-trichloroethane 7 7 0 0	(95P) (13-29-7 eC-endeaultan
(13V) 75-34-3 (,)-dichiereethane 54.0	(96P) 113-29-7 B -energy/Lan
(14V) 79-00-5 1,1,2-trichlorogenane 5 U	(97P) 1031-07-8 endorulfan milfate
(15V) 79-34-5 (,1,2,2-terrachiprositiane 10 U	(98P) 72-20-4 engin
(16Y) 75-00-3 chleroethane 10 U	(999) 7621-93-6 endrin sidehyde :
(19V) 110-75-8 2-chleroethylvinyl ether 10 U	(100P) 76-44-8 -heptschier
(23V) 67-46-) chiereterm 5 U	(1017) (024-57-3 heptachler spoxide
(29V) 75-33-4 (.1-dichloroethene 6/2.0	(102P))19-84-6 ≪-8HC
(30V) 156-60-5 trans-1,2-dichloroethene / 75 4 . O	(103P) 319-43-7 A -8HC
(32V) 75-87-5 1,2-dichteropropane 10 U	(100P) 319-86-8 6-8HC
	(103P) 18-89-9 7'-BHC (lindane)
- 1 CIP (1) - OCIO (IO COPTO C	
132 A	(107P) 11097-69-1 PCB-1234
10.0	(104P) 11100-28-2 PCB-1221
	(109P) ((101-16-5 PCB-1232
(101) (101) Ordiformation	(110P) 12673-29-6 PCB-1248
(25.5) (25.5) Manuscami	([11P] 11096-82-3 PCB-1260
(48Y) 73-27-4 bromodicatoromethane 5 II	(1(2P) 12676-11-2 PCB-1016
(49V) 75-69-4 (luorestrich)gramethene 10 U	(113P) 8001-35-2 texaphene
(50V) 75-71-8 dichleredi(luoremethane 10 U	
(31Y) (24-48-1 chieredibrememeriane 10 U	
(85V) 127-13-5 tetrachleroethene 43.0	DIOXIPES
(86Y) (08-68-) toluete 5 U	CONCENTRATION: LOW MEDIUM HIGH (circle one)
(\$7V) 75-01-6 trichlersethene 20/20	DATE EXTRACTED/PREPAREDI
(\$EV) 75-QL-& vinyl chloride 10 U	DATE ANALYZED
47-64-1 acetane 5 U	PERCENT MOISTURE
71-13-3 3-bustanene 22.0C	CONC./DILUTION FACTOR:
75-13-0 carpendisuitide 1 U	
	ug/L er ug/kg
108-10-1 t-methyl-2-pentanone 5 U	PP # CAS # (circle one)
100-±2-5 styrene 5 U	(1298) 1795-01-6 2,3,7,1-terrachiprodibenza-p-dioxin NA
108-05-6 vinyl scetate 60.0.C	
1330-20-7 total sylenes 5 U	Oecemeer 1983

- ${\tt U}$ Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

 K - Actual value, within the limitations of this method, is less than the value given.

 CX - Compounds which were concentrated by a factor of 10 times.

 B - Slank > 1/2 method 0.1, and > 1/2 conc. in sample. Report NO 8

 C - Blank > 1/2 method 0.1, and < 1/2 conc. in sample. Report (corrected conc.) C



					,			
		AL PROTECTION AGENC orus, Yurgulus 22313 - 703		HAMIT OX	tice		Sample Numb	
		•					LC 708	6
		ERG. INC.	ORGANICS ANALY	SIS DAT	A SHEET	2873		
Laborac	ory Names 🔍			. Case f	You	4013		
Lab Sen	npie ID Noi j		9626	QC Re	MORT NOT			
Sample	Matrici	WATER		Contra	act Neut	<u> </u>	-6369	
Data Re	elease Author	ized Bys	12/1 1811	Date :	iample Recei	ved:		4
		_WOLKTILES V					(0) (0)	
							CEDES (8Y GC)	
		4. (COM) WEBIUM HIGI					NUM HIGH (circle	one)
		DIPREPARED:	NA NA			ed/Prepared	· ———	
	ANALYZEC		- 7 		E ANALYZE			
	ENT MOIST			PER	CENT MOIST	URE:		
CONC		FACTOR:	NA	CON	VC./DILUTIO	N FACTOR:		
								ug/ 1
27 6	CAS		(circle one)	22.6	CAS#			or ug/kg
	107-02-8	andain.	100 U					(circle one)
(27)		ACCOLUNIA	100 U	(899)	109-00-2	Aldrin		- NA
(JV)	107-13-1	acrylenitrile	- 100 U	(90P)	60-57-1	<u>dieldrin</u>		- ' ' '
(AV)	71-43-2	benzene	<u></u>	(919)	37-74-9	chlandane		-
(6V)_	36-23-3	carbon setrachloride	<u>-</u>	(727)	<u> </u>	*, WDDT)
<u> </u>	108-90-7	Chiorobenzene		(93P)	72-55-7	<u>+,+-008</u>		-
(101)	107-06-2	1.2-dichlorogthane		(94)	77-54-6	***-000		-
(IIX)	71-35-6	i.i.i-trichloroethene	45.0 C	(95P)	115-29-7	_ e≤ -endeeul les		-
(134)	75-34-3	[,]-dichloroethane	<u> </u>	(76P)	113-23-7	A -entired a		-
(194)	79-00-3	1,1,2-trichigraethene	<u> </u>	(977)	1031-07-4	- andorrelian ev	49.41	I
((2A)	79-34-3	(,1,2,2-tetrachiorgenan		(969)	72-20-6			-
(16V)	75-00-3	chigrosthane	10 U	(99F)	7421-53-4	endrin aldeliy	*	-
(1797)	110-75-8	2-chloroethylvinyl ether		(100P)	76-44-5	heptachler		- }
(2 3 V)	67-44-)	chlorotorm	5 U	(1017)	1024-17-1	haptachier ep	exide	_ l
(29Y)	75-35-4	I, I -dichloroethene	39.0 C	(102F)	319-49-4	≪Ç-BHC		(
(30V)	156-60-5	trans-1,2-dichleroethene		(103P)	319-45-7	B-BHC		_
(324)	72-47-5	1,2-dictrioropropane	10 U	(104P)	319-86-8	S-BHC		_
(33A)	10041-02-6	trans-I, J-dichleropropen		(TOIL)	78-49-9	7-BHC (line	iane)	_
	0061-01-02	cis-1,3-dichlorepropens	5 y	(106P)	53449-21-9	PCB-1242		- 1
(384)	100-41-4	estryibensone	5 U	(107P)	11097-69-1	PC9-1234		- 1
(444)	77-07-7	methylene chloride	NDB	(102P)	11104-28-2	PC8-1221		<u> </u>
(95V)	79-47-3	Chiloromethane	10 U	(1099)	11141-16-3	PC8-1232		-]
(46V)	74-43-9	bromomethane	10 U	(1100)	12672-29-6	PC8-1248		_
(47V)	75-25-2	bromoform	10 U	(IIII)	11096-12-5	PC3-1260		_
(4EV)	75-27→	bromodichloromethane	5 1	(1135)	12674-11-2	PCB-1014		_ •
(49Y)	75-49-4	(lugretrichtgromethene	10 U	(1117)	8001-15-2	(4xx0/rene		_ '
(304)	75-71-4	dichiorodifivoremethane	10 U					
(51V)	125-48-1	chierodibrememenhane	10 U					
(83V)	127-18-4	tetrachleroethene	160.0			DIOXIN	5	
(86V)	(08-48-3	colyana	5 บ	COM	CENTRATIO	N. LOW MEDI	UM HIGH (circle o	nel .
(87Y)	79-01-6	trichleroethene	4800.0			D/PREPARED		
(28V)	79-01-4	vinyl chloride	44.0		E ANALYZEI		·	
	(7-44-)	ACRIONA	5 U		E ANALI LEL CENT MOSTI			
	78-93-3	2-butanone	ND B		CADILUTION			
	79-15-0	carbondicullido	ı U	COM				
	319-78-6	2-hexanone	5 U					ug/I
	109-10-1	4-methyl-2-pentanone	ร บ	F	CASA		1	er ug/kg (curcie one)
	(00-42-5	11YTHON	5 U			2.3.7.5-tetraci	Noredibento-p-diexi	
		VIIIVI SCREATE	5 U	<u></u>				

- U Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

 K Actual value, within the limitations of this method, is less than the value given.

 CX Compounds which were concentrated by a factor of 10 times.

 B Blank > 1/2 method D.L. and > 1/2 conc. in sample. Report ND B

 C Blank > 1/2 method D.L. and < 1/2 conc. in sample. Report (corrected conc.) C

1330-20-7 total sylenes



, envtronment), box 115, Alexar	'AL PROTECTION AGENC' Ideia, Virginia 22313 - 703	V - CLP Sample Manage /557-2490	ement Of	fice		Sample Number
		ORGANICS ANALY		4 CUEST		C 7087
Na-a-	ERGINC.	OKENNICE VIANTE	Case		2373	
peratory Names ,	06/109	627	•	part Not		
Sample ID Not	WATER	/		ICT No-1	1- V = N	-6369
nple Matrixi		and the second	•			7 84
ta Release Autho	rized by:	<u> </u>	_ Date:	iample Reces	rea:	
	VOLATILES				PEST	CEDES (BY GC)
CONCENTRATIO	NI (LOW) MEDIUM HIGH	(circle one)	CO	CENTRATIO		IUM HIGH (circle one)
ATE EXTRACT	\	NA.			ED/PREPAREI	
ATE ANALYZE		34		E ANALYZE		^
ERCENT MOIST		NA		CENT MOIST		
ONC./DILUTION		NI A		C./DILUTIO		
.000			401		Tracion ,	
	•	or verification				ug/(
e case		(circle one)	PP #	CAS		er uig/ (circle :
7) 107-02-8	acrolein	100 U	(\$9P)	309-00-2	aldrin	
107-13-1	acrylonitrile	100 U	(90P)	60-57-1	dieldrin	N.
71-43-2	bentene	5 U	(918)	37-79-9	chierdane	
16-23-1	carbon tetrachionida	5 U	(939)	50-27-3	1,00-007	
7 108-90-7	chlerobensone	5 U	(93P)	72-13-9	4,4'-DDE	
V) 107-06-2	1,2-dichloroethene	1 0	(90P)	77-54-8	4,4'-ODD	
v) 71-35-4	I, I, I-trichlorgethane	NO B	(95P)	115-29-7	< -endoquifa	
V) 75-34-3	I, I -dichieresthene	ND B	(96P)	115-29-7	β -endosuita	
		5 U	(977)	1031-07-8		
	1,1,2-trichlargethang		(942)		enderuiten tu	114/4
<u>V) 79-34-3</u>	1,1,2,2-retrachloroethan	10 0		72-20-8	endrin	
<u>V) 73-00-3</u>	chloreethene	- <u>10 ŭ</u>	(79P)	7421-93-4	endrin aldehy	-
V) 110-75-8	2-chloroethylvinyi ether	5 U	(100P)	76.44.8	hantachler	
V) 67-66-3	chlereform		(101P)	1024-57-3	heptachter ep	oxide
V) 75-35-4	1,1-dichtereethene		(102P)	319-84-6	<-BHC	
V) 136-60-3	trans-1,2-dichlaroethane		(103P)	319-85-7	A -BHC	 [
Y) 78-87-5	1,2-dichloropropane	10 U	(104F)	319-46-8	<i>δ</i> -8HC	
V) 10061-02-6	tran-1,3-dichloropropen		(105P)	58-89-9	7-BHC (line	iane)
10061-01-05	cis-i.)-dichloroprosene	5 U	(106P)	<u> 13469-21-9</u>	PC8-1247	
A) 100-+1-+	ethyibenzone	5 U	(107P)	11097-69-1	PCB-1254	
V) 73-09-2	methylene chloride	NO B	(10EP)	11104-28-2	PCB-1221	
V) 74-87-3	<u>Chioremethene</u>	10 U	(LQ9P)	11101-16-5	PC8-1232	
V) 74-43-9	promomerhane	10 U	(110P)	12672-29-6	PCB-1248	
V) 73-23-2	brometorm	70 G	(HIP)	11076-82-3	PCB-1260	
V) 75-27-4	bremedichleromethane	5 <u>u</u>	(112P)	12674-11-2	PC8-1016	
V) 73-49-4	flugratrichlaramethere	10 U	(113P)	8001-35-2	toxaphene	
v) 75-71-4	dichlorodifluoromethene	10 U				
V) 29-45-1	chlorodibremomentune	10 U				
V) 127-18-4	tetrachloroethene	5 U			DIOXI	5
V) (08-48-3	tolume	5 Ú				
V) 79-01-6	trichieroethene	NOB				IUM HIGH (circle one)
V) 73-01-4	vinyt chloride	10 U			D/PREPARED	'
67-44-1	ACETOR	5 Ŭ		ANALYZE		
78-13-1	?-butanene	ND B	_	CENT MOIST		
73-13-0	carbondisuifide	- '\' i U	CON	CADILUTION	FACTOR:	
		5 0				ug/L
313-78-4	2-hestanene	5 U	22.0			ar ug/l
10 8 -10-1	4-methyl-Z-pentanone	5 U	er v	CAS#		circle o N Namedibens ~ a-diaxin N

- U Compound was analyzed for but not detected. The number is the minimum at: ¹ ble detection limit for the sample.

 K Actual value, within the limitations of this method, is less than the value given.

 CX Compounds which were concentrated by a factor of 10 times.

 β Blank > 1/2 method 0.L. and > 1/2 conc. in sample. Report NO B

 C Blank > 1/2 method 0.L. and ≤ 1/2 conc. in sample. Report (corrected conc.) C

108-05-A

vinyi acetate 1330-20-7 total xylenes

OPPOSITOR OF THE PROPERTY OF T

APPENDIX E

SEPA Notification of Hazardous Waste Site

United States
Environmental (CRAG)
Agency
Washington DC 20460

	This initial notification information required by Section 103(c) of the hensive Environmental Response, sation, and Liability Act of 1980 a be mailed by June 9, 1981.	Comprer-	addition paper.	indicate applies.	ce, use s I the lett	ink, if you ne eparate shee er of the item	ts of		•		•	 ز
Ā	Person Required to Notify:						_	١.				
	Enter the name and address of th	e person	Name			Matthey	Inc.				-	
	or organization required to notify.		Straet	4	Malin	Road					•	
			CitA	Ма	lvern			State	PA	Zip Code	19355	
В	Site Location:						_	 				
	Enter the common name til know	n) and .	Name e	f Site	Bish	on Tube	Co.				 	
	actual location of the site.	Street		Rout	e 30 and	Malin	Road	•				
<u>a:</u>	S. 40 101 000	.0		Malv						Zip Code	10355	
	<u> </u>	<i>y</i> -1	C-tv	1-10-1	6111	County	neacer	51000	FA	Zip Code	17377	
C	Person to Contact:	•			_					_		
	Enter the name, title (if applicable		Name (Last, Form	and Titlet	<u>Curtis</u>	Barb	ara	inv.	ron. Sr	eciali	st_
	business telephone number of the to contact regarding information submitted on this form.	Phone	(215)	648-82	78	-					
_	Dates of Waste Handling:						1969 -	sold	to V	hittake	r Corp	
_	Enter the years that you estimate	WASIA					-			ended t	_	. 7
	treatment, storage, or disposal be ended at the site.		From (Y	<u>4801 L'</u>	951	To (Year)	<u> </u>	<u>arsb</u>)Bal	ended t	N DISU	<u>ob</u> r
E	Waste Type: Choose the optio	u Aon, bu	efer to	comple	10 ,							
	Option I: Select general waste ty, you do not know the general wast encouraged to describe the site in	e types or	SOUTCH	s, you a	re		onservati	on and f	jecover	persons far y Act (RCRA		
	General Type of Waste: Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.	Source of Place and boxes.			riate	listed in the appropriate the list of it	isigned a e regulation four-dig: nazardous	faur-digi ons undi t numbe wastes	ir Section r in the and cod	er to each h on 300t of boxes provi les can be o he State in	RCRA. Ent Ided. A cop Ibtained by	er the by of '
	1. 🗆 Organics	1. 🗆 Me	•]					_		_
	2. C inorganics	2 C C		IOT	ł] [
	3. Solvents	3. [] Ter			J] [J
	4. © Pesticides 5. © Heavy metals	4. [] Fet 5. [] Par		01.00	į					- I		4
	6. 12 Acids	S. C. Lea	-	•			—			┥ ├─		4
	→ □ Bases	7. 🗅 iro		•	,		 	-		┥ ├	· · ·	4
	8. C PCBs	8. C Ch			•			-		┥ ├─		┥
	9. Mixed Municipal Whose	9. 🗆 Pla	iting/P	olishing		` 	_			 		4
	1Q. 🗆 Unknown	10. 🗆 Me	htary//	- Mmunii	non) 	 			7 —		7
	11. 22 Other (Specify)	11. 🖸 Ele			ors							L
	Non EP Toxic Metals	12. 🗆 Tra	ensform	16/5								_

13.
Utility Companies 14 🛘 Sanitary/Refuse 15 () Photolinish 16. Lab Hospital

18. 3 Other (Specify)
Stainless Steel pickling

12 🗓 Unknown

-÷·

ORIGINAL 75

Place an X in the appropriate boxes to indicate the facility types found at the site. In the "total facility waste amount" space give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gailons. In the "total facility waste amount" space give the estimated area size which the facilities occupy using square feet or acres. 1. □ Piles 2. □ Land Treatment 3. □ Landfill 4. □ Tanks 5. □ Impoundment 6. ℚ Underground injection 7. □ Drums, Above Ground 8. □ Drums, Below Ground 9. □ Other (Specify)		· ·		Untamas									
Picce an X in the appropriate boors to in the "local facility waste amount" state in the "local facility waste amount" state in the "local facility waste amount" state gove the estimated combined authority froblume) of hazardous wastes at the site stang-outh estimated combined facilities gove the estimated combined facilities gove the estimated assignment facilities gove the estimated assignment facilities gove the estimated assignment facilities and provided the state of the state		Notification of Hazardous Waste Site	Side Two	(Red)									
In the Total Racing water amount's space give the estimated caphined quantity tofunded in Asserbasia wasted at the sate produced of Asserbasia wasted at the sate produced and the sate produced of Asserbasia wasted at the sate produced and the sate produced of Asserbasia wasted the facilities of Clumpundent and the Total Facility Area of Clumpundent and the Total Facility Area of Clumpundent and the Total Facility Area of Clumpundent and the Total Facility Area of Clumpundent and the Total Facility Area of Clumpundent and the Total Facility Area of Clumpundent and the Total Facility Area of Clumpundent and the Total Facility Area of Clumpundent and the Total Facility Area of Clumpundent and the Total Facility Area of Clumpundent and the Total Facility Area of Clumpundent and the Total Facility Area of Clumpundent and the Clumpundent and the Total Facility Area of Clumpundent and the Clumpundent	F	Waste Quantity	Facility Type	Total Facility Waste Amount									
Land Freement Line Teaching types Sound at the site Line The Teach Eaching water sound." Sace gove the estimated combined quantity Lasting clube feet or gallons. Line The Teach Eaching water sent the trief the stating clube feet or gallons. Line The Teach Eaching water speec, give the estimated cares size which the facilities occupy using square feet of acres. So Compoundment So Control (Speech) Known, Suspected or Likely Releases to the Environment: Place an X in the appropriate boses to indicate any known, suspected. Known, Suspected or Likely Releases to the Environment: Place an X in the appropriate boses to indicate any known, suspected. Note: Items Hand I are optional. Completing these steems will asses EPA and State and I all governments in locating and assess particularly and provided the state of the environment. Note: Items Hand I are optional. Completing the stems of required, you are encouraged to do so I shareh Map of State beasting. (Optional) Each and private greates the state of the province of the state of the sta			1. C Piles	cube test Note (A)									
give the estimated combined quantity relating to the product for graded loss g		In the "total facility waste amount" space		gariors Note (A)									
using cubes feet or galons. In the Total Lamity area "space, give the estimated area size which the Scitties" \$ 2 Underground Impection 7.			- -	Total Facility Area									
Skinds are see which he facilities occupy using square feet or acre. Commandation Commandat		using cubic feet or gallons.	• = •	square feet 360									
8. Other (Specify) 8. Other (Specify) 8. Other (Specify) 8. Other (Specify) 8. Other (Specify) 8. Other (Specify) 8. Other (Specify) 8. Other (Specify) 9. Other (Specify)													
Note: Items Hand are optional. Completing these terms will asset EPA and State and Call governments in locating and assessing a processes of westers to the environment. Call governments in locating and assessing a processes of westers to the environment. Call governments in locating and assessing a process of westers to the environment. Call governments in locating and assessing a process of the				8001									
Place an X in the appropriate bases to indicate any known, suspected. Which releases of westers to the environment. Note: (B) Not			9. Other (Specify)										
witely releases of westers to the environment. Note (B) Note: Items thand I are optional. Completing these items will assist EPA and State and Lod governments in locating and assessing hazardous westers the State. Although completing the items a not required, you are encouraged to do so States the are of the traveller. (Optional) States are man channels streets, bigneries, the size it may substitute a getting and active the size ignered. Others are arrow showing the size location. (A) The amount of hazardous waste to be found at the site is unknown due to the unavailability of data as to the amount rendered non-hazardous by natural process. Approximately 8,000 gallons of acid waste was discharged per year in a stream containing 3.25 million gallons of non-hazardous waste water. J. Bishop & Co. Platinum Works opened the site in the size and describe are nearby wells. 1967. Matthey Bishop sold the Plant as Bishop Tube Co. to the Militaker Corporation on 31 March, 1969. Whittake sond any enser information or comments which may neighbore the wester came from. Provide any enser information or comments which may neighbore the wester came from. Provide any enserting well as a size of the person of the size of hazardous waste from the above facility has been observed or detected, however, the possibility of some release cannot be discounted. In the absence of recorded data, it has been necessary to compile the foregoing data on the basis of the person locations of the person of authorized representative intensive of the person of authorized representative intensive of the person of authorized representative intensive of the person of authorized representative intensive of the person required to only must say in the form and provide a maining address of altitude to the person required to only must say in the form and provide and the monity cheef. The same person of authorized representative intensives of altitude to the person required intensive color of the person required in only refer to the person required in	G	Known, Suspected or Likely Releases	to the Environment:										
Secret May of Site to complete the secret of the promoted promoted the secret of the promoted states a map showing streets bigwinds. Secret a map showing streets bigwinds. The amount of hazardous waste to be found at the site is unknown due to the unavailability of data as to the amount rendered non-hazardous by natural process. Approximately 8,000 gallons of acid waste was discharged per year in a stream containing 3.25 million gallons of non-hazardous waste water. Description of Site: (Optional) Observe the heavy and present containing 3.25 million gallons of non-hazardous waste water. J. Bishop & Co. Platinum Works opened the site in conditioned of the site (see directions to the site of													
Senich a man above on street, higher the results or other promispher thinks near the site site. He see a provide the map to indicate the site specified forew an arrow abovening in a street of the site of the site of the site of the unavailability of data as to the amount rendered non-hazardous waste por year in a stream containing 3.25 million gallons of acid waste was discharged per year in a stream containing 3.25 million gallons of non-hazardous waste water. J. Bishop & Co. Platinum Works opened the site in 1951. The name was changed to Matthey Bishop, Inc. in 1951. The name was changed to Matthey Bishop													
review or other promispated marks near the size fives use. Place 30.1401 the map to indicate the size incesses the size fives use fives one fives an arrow showing ing swetten north. You may substitute a goldishing map showing the size location. (A) The amount of hazardous waste to be found at the site is unknown due to the unavailability of data as to the amount rendered non-hazardous by natural process. Approximately 8,000 gallons of acid waste was discharged per year in a stream containing 3.25 million gallons of non-hazardous waste water. J. Bishop & Co. Platinum Works opened the site in contained describe and extends to some sites, so thousing include such information as how waste was discosed and where the weste came from provide any other information or comments which may help describe the site conditions. Discounted. J. Bishop & Co. Platinum Works opened the site in 1967. Matthey Bishop sold the Plant as Bishop Tube Co. to the Whittaker Corporation on 31 March, 1969. Whittaker Corporation on 31	#	Sketch Map of Sity basetism (Option	ai)	·									
the unavailability of data as to the amount rendered non-hazardous by natural process. Approximately 8,000 gallons of acid waste was discharged per year in a stream containing 3.25 million gallons of non-hazardous waste water. Description of Site: (Optional)		routes or other prominent and marks near the site. Place an Arth the map to indicate the site legislith. Draw an arrow showing the sirection north. You may substitute a											
the unavailability of data as to the amount rendered non-hazardous by natural process. Approximately 8,000 gallons of acid waste was discharged per year in a stream containing 3.25 million gallons of non-hazardous waste water. Description of Site: (Optional)		(A) Man amount of house-in-		and the decomposition days the									
Description of Site: (Optional) Description of Site: (Optional) Description of Site: (Optional) Description of the site of present conditions of the site of present states of household first states of the site of the whittaker Corporation on 31 March, 1969. Whittaker of the whittaker Corporation on 31 March, 1969. Whittaker sold it to Christiana Metals on 7 January, 1974. The Plant is now called: Bishop Tube Co., Division of Christiana Metals Corp. Matthey Bishop changed its name to Johnson Matthey Inc. on 1 April, 1980. (B) Unknown. No release of hazardous waste from the above facility has been observed or detected, however, the possibility of some release cannot be discounted. In the absence of recorded data, it has been necessary to compile the foregoing data on the basis of the personal knowledge, recollection and estimate such that the first states of alternets of persons required to noutly must up the form and provide a making address of deferent manders in the form and provide a making address of deferent and address in the first state of the person required to noutly must up the form and provide a making address of deferent manders in the form and provide a making address of deferent manders in the first state of the person required to noutly must up the form and provide a making address of deferent manders in the first state of the person required to noutly must up the form and provide a making address of deferent manders in the first state of the person required to noutly must up the form and provide a making address of deferent than address in the first person required to noutly must up the form and provide a making address of deferent than address in the first person required to noutly first person required to nou		• • • • • • • • • • • • • • • • • • • •											
Description of Site: (Optional) Description of Site: (Optional				_									
Description of Site: (Optional) Description of Site: (Optional) Description of Site: (Optional) Description of Site: (Optional) Description of Site: (Optional) Description of Site: (Optional) Description of Site: (Optional) Description of Site: (Optional) Description of Site: (Optional) J. Bishop & Co. Platinum Works opened the site in conditions of the site and describe any enterty wells. Storings, Islees, or housing, Include such information as how waste was discossed and where the weste came from. Provide to the Whittaker Corporation on 31 March, 1969. Whittaker Corporation on 31 March, 1969. Whittaker Sold it to Christiana Metals on 7 January, 1974. The Plant is now called: Bishop Tube Co., Division of Christiana Metals Corp. Matthey Bishop changed its name to Johnson Matthey Inc. on 1 April, 1980. (B) Unknown. No release of hazardous waste from the above facility has been observed or detected, however, the possibility of some release cannot be discounted. In the absence of recorded data, it has been necessary to compile the foregoing data on the basis of the personal knowledge, recollection and estimate such as plant managers, supermendems, required to notify the formation address the described the relationship to the site of the person or authorized representative in mainty check "Other" Johnson Matthey Inc. Johnson Matthey													
Description of Site: (Optional) Description of Site: (Optional) Description of Site: (Optional) Description of Site: (Optional) Description of Site: (Optional) Description of Site: (Optional) Description of Site: (Optional) J. Bishop & Co. Platinum Works opened the site in conditions above waste was discossed on the site and describe any nearby wells. Springs, lakes, or housing, include such information as how waste was discossed and where the weste came from Proude any other information or comments which may help describe the site conditions. 1951. The name was changed to Matthey Bishop, Inc. in 1967. Matthey Bishop sold the Plant as Bishop Tube Co. to the Whittaker Corporation on 31 March, 1969. Whittaker is now called: Bishop Tube Co. Division of Christiana Metals Corp. Matthey Bishop changed its name to Johnson Matthey Inc. on 1 April, 1980. (B) Unknown. No release of hazardous waste from the above facility has been observed or detected, however, the possibility of some release cannot be discounted. In the absence of recorded data, it has been necessary to compile the foregoing data on the basis of the personal knowledge, recollection and estimate such as plant managers, superintendents, itustees or autorneys) of persons required to notify must signt he form and provide a making address (4 different than address in tem At For other persons providing notification, the signature is optional. Check the boase winch best describe the relationship to the size of the person required to notify the person of such person required to notify the person required to notify the person required to notify the person required to notify the person required to notify it you are not required to notify the person required to notify the person required to notify the person required to notify the person required to notify the person required to notify the person required to notify the person required to notify the person required to notify the person required to notify the person required to notify the person required to		<u>-</u>	LITORS OF HOR-HAZARdous waste										
Describe the history and present conditions to the site. Give directions to the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing, include such information or how waste was discoved and where the weste came from. Provide any other information or comments which may help describe the site conditions. 1951. The name was changed to Matthey Bishop, Inc. in 1967. Matthey Bishop sold the Plant as Bishop Tube Co. to the Whittaker Corporation on 31 March, 1969. Whittaker Corporation on 31 March, 1969. Whittaker is now called: Bishop Tube Co., Division of Christiana Metals Corp. Matthey Bishop changed its name to Johnson Matthey Inc. on 1 April, 1980. (B) Unknown. No release of hazardous waste from the above facility has been observed or detected, however, the possibility of some release cannot be discounted. In the absence of recorded data, it has been necessary to compile the foregoing data on the basis of the personal knowledge, recollection and estimate such as plant managers, superintendents, trustees or attorneys of persons required to notify must sign the form and provides making address (if different than address in deem Al. For other persons providing notification, the signature is optional. Check the bones which best describe the relationship to the site of the person required to notify if you are not required to notify if you are no		weret	•										
Describe the history and present conditions to the site. Give directions to the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing, include such information or how waste was discoved and where the weste came from. Provide any other information or comments which may help describe the site conditions. 1951. The name was changed to Matthey Bishop, Inc. in 1967. Matthey Bishop sold the Plant as Bishop Tube Co. to the Whittaker Corporation on 31 March, 1969. Whittaker Corporation on 31 March, 1969. Whittaker is now called: Bishop Tube Co., Division of Christiana Metals Corp. Matthey Bishop changed its name to Johnson Matthey Inc. on 1 April, 1980. (B) Unknown. No release of hazardous waste from the above facility has been observed or detected, however, the possibility of some release cannot be discounted. In the absence of recorded data, it has been necessary to compile the foregoing data on the basis of the personal knowledge, recollection and estimate such as plant managers, superintendents, trustees or attorneys of persons required to notify must sign the form and provides making address (if different than address in deem Al. For other persons providing notification, the signature is optional. Check the bones which best describe the relationship to the site of the person required to notify if you are not required to notify if you are no			-										
Describe the history and present conditions to the site. Give directions to the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing, include such information or how waste was discoved and where the weste came from. Provide any other information or comments which may help describe the site conditions. 1951. The name was changed to Matthey Bishop, Inc. in 1967. Matthey Bishop sold the Plant as Bishop Tube Co. to the Whittaker Corporation on 31 March, 1969. Whittaker Corporation on 31 March, 1969. Whittaker is now called: Bishop Tube Co., Division of Christiana Metals Corp. Matthey Bishop changed its name to Johnson Matthey Inc. on 1 April, 1980. (B) Unknown. No release of hazardous waste from the above facility has been observed or detected, however, the possibility of some release cannot be discounted. In the absence of recorded data, it has been necessary to compile the foregoing data on the basis of the personal knowledge, recollection and estimate such as plant managers, superintendents, trustees or attorneys of persons required to notify must sign the form and provides making address (if different than address in deem Al. For other persons providing notification, the signature is optional. Check the bones which best describe the relationship to the site of the person required to notify if you are not required to notify if you are no			_										
Describe the history and present conditions to the site. Give directions to the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing, include such information or how waste was discoved and where the weste came from. Provide any other information or comments which may help describe the site conditions. 1951. The name was changed to Matthey Bishop, Inc. in 1967. Matthey Bishop sold the Plant as Bishop Tube Co. to the Whittaker Corporation on 31 March, 1969. Whittaker Corporation on 31 March, 1969. Whittaker is now called: Bishop Tube Co., Division of Christiana Metals Corp. Matthey Bishop changed its name to Johnson Matthey Inc. on 1 April, 1980. (B) Unknown. No release of hazardous waste from the above facility has been observed or detected, however, the possibility of some release cannot be discounted. In the absence of recorded data, it has been necessary to compile the foregoing data on the basis of the personal knowledge, recollection and estimate such as plant managers, superintendents, trustees or attorneys of persons required to notify must sign the form and provides making address (if different than address in deem Al. For other persons providing notification, the signature is optional. Check the bones which best describe the relationship to the site of the person required to notify if you are not required to notify if you are no	_	Description of Site: (Optional)											
conditions of the site. Give directions to the site and describe any nearby wells, sorings, lakes, or housing, include such information as how waste was disposed and where the weste came from. Provide any other information or comments which may help describe the site conditions. 1951. The name was changed to Matthey Bishop, Inc. in 1967. Matthey Bishop sold the Plant as Bishop Tube Co. to the Whittaker Corporation on 31 March, 1969. Whittaker on the Whittaker Corporation on 31 March, 1969. Whittaker sold it to Christiana Metals on 7 January, 1974. The Plant is now called: Bishop Tube Co., Division of Christiana Metals Corp. Matthey Bishop changed its name to Johnson Matthey Inc. on 1 April, 1980. (B) Unknown. No release of hazardous waste from the above facility has been observed or detected, however, the possibility of some release cannot be discounted. In the absence of recorded data, it has been necessary to compile the foregoing data on the basis of the personal knowledge, recollection and estimate J. Signature and Title: Of currently employed personnel of Bishop Tube Co. The person or surforced representative issues or successful of determined employed personnel of Bishop Tube Co. The person or surforced representative issues or successful determined and provide a making address of different than address in item Al. For other persons providing notification, the signature is optional. Check the boses which best describe the relationship to the site of the person required to notify if you are not required to notify if you are not required to notify if you are not required to notify if you are not required to notify if you are not required to notify if you are not required to notify if you are not required to notify if you are not required to notify if you are not required to notify if you are not required to notify if you are not required to notify if you are not required to notify if you are not required to notify if you are not required to notify if you are not required to notify if you are not requi	•		T Bishop & Co Plat	inum Works opened the site in									
(B) Unknown. No release of hazardous waste from the above facility has been observed or detected, however, the possibility of some release cannot be discounted. In the absence of recorded data, it has been necessary to compile the foregoing data on the basis of the personal knowledge, recollection and estimate the person of authorized representative (such as plant managers, superintendents, trustees of attorneys) of persons required to notify must sign the form and provide a making address (diditerent than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify if you are not required to notify there? Signature and Title: Of currently employed personnel of Bishop Tube Co. Downer, Present Cover, Past C		conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing, Include such information as how waste was disposed and where the waste came from, Provide any other information or comments which may help describe the site conditions.	1951. The name was chang 1967. Matthey Bishop sol to the Whittaker Corporat sold it to Christiana Met Plant is now called: Bish Christiana Metals Corp.	ged to Matthey Bishop, Inc. in d the Plant as Bishop Tube Co. ion on 31 March, 1969. Whittak als on 7 January, 1974. The top Tube Co., Division of Matthey Bishop changed its name									
observed or detected, however, the possibility of some release cannot be discounted. In the absence of recorded data, it has been necessary to compile the foregoing data on the basis of the personal knowledge, recollection and estimate Signature and Title: of currently employed personnel of Bisnop Tube Co. The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify if you are not required to maily check "Other" A possible person required to notify if you are not required to maily check "Other" Howard S. Roberts													
In the absence of recorded data, it has been necessary to compile the foregoing data on the basis of the personal knowledge, recollection and estimate Signature and Title: Of currently employed personnel or Bisnop Tube Co. The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a making address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify if you are not required in multy check "Other" In the absence of recorded data, it has been necessary to compile the personal knowledge, recollection and estimate the person Tube Co. Name Johnson Matthey Inc. Size Malin Road City Malvern State PA Zie Code 19355 City Malvern State PA Zie Code 19355 City Malvern Ome 6/8/81 Howard S. Roberts		• •											
the foregoing data on the basis of the personal knowledge, recollection and estimated and Title: J Signature and Title: Of currently employed personnel of Bishop Tube Co. The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (diditerent than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify if you are not required to maily check "Other" The person or authorized representative employed personnel of Bishop Tube Co. Johnson Matthey Inc. J Owner, Present Co Owner, Past Giv Malvern State PA Zie Code 19355 City Malvern State PA Zie Code 19355 City Malvern Ome 6/8/81 Howard S. Roberts		discounted.											
J Signature and Title: Of currently employed personnel of Bisnop Tube Co. The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a making address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify if you are not required in multy check "Other" Name Johnson Matthey Inc. Size Johnson Matthey Inc. Chowner, Present Cowner, Past City Malvern State PA Zie Code 19355 City Malvern State PA Zie Code 19355 City Malvern Dame 6/8/81 Howard S. Roberts													
The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify if you are not required in muly check "Other" Name Johnson Matthey Inc. Summ 4 Malin Road City Malvern State PA Zie Code 19355 City Malvern State PA Zie Code 19355 City Malvern State PA Zie Code 19355 City Malvern Date 6/8/81 Howard S. Roberts	_												
(such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify if you are not required in notify check "Other" Size 4 Malin Road Click Owner, Pass	J												
to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify if you are not required in notify check "Other" Line Malin Road City Malvern State PA Zie Code 19355 City		(such as plant managers, superintendents,	Name Johnson Matthey Inc										
in item Al. For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify if you are not required in notify check "Other" City Malvern State PA 2/8 code 19355 Check the boxes which best describe the relationship to the site of the person required in notify check "Other" Howard S. Roberts		trustees or attorneys) of persons required to notify must sign the form and provide a	Street 4 Malin Road	CI Transporter									
Check the boxes which best describe the relationship to the site of the person required to notify if you are not required in notify check "Other" Howard S. Roberts		in item A). For other persons providing	City Mal yarn See	20. 4 c U 455									
relationship to the site of the person required to notify if you are not required to notify there. Separate Sep		Check the boxes which best describe the	PIDE VELIA	OL Operator, rest									
to nouty check "Other" Howard S. Roberts		relationship to the site of the person	Sinnature	ome 6/8/81									
· · · · · · · · · · · · · · · · · · ·		to units check "Other,, radenge in court is longed upt tednited											

APPENDIX F



SOIL SURVEY

ORIGINAL (Red)

Chester and Delaware Counties, Pennsylvania



UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
PENNSYLVANIA STATE UNIVERSITY
College of Agriculture and Agricultural Experiment Station
and the
PENNSYLVANIA DEPARTMENT OF AGRICULTURE

Soil Conservation Commission

discontinuous films of silt on peds; friable; medium acid (pH 5.8); gradual, wavy lower boundary; 8 to 10 inches thick.

24 to 50 inches, yellowish-red (5YR 5 6) silt loam; common, medium, distinct mottles of gray (10YR 5/1); thick, platy structure that breaks to pieces that subdivide into moderate fine, subangular blocky structure; firm; strongly acid (pH 5.2)

The variations in this soil are in the thickness and color of the horizons. The texture of the subsoil ranges from loam to silty clay loam. The parent material consists of alluvium washed from the Hagerstown or Conestoga soils. In a few places the alluvium has been transported for short distances through areas of soils underlain by mica, schist, or quartzite.

The Lindside soils are moderately permeable. have high available moisture capacity and are moderately high in fertility. In most places the soils are free of stones. They are saturated for prolonged periods and have mottles in the lower part of the subsoil. In most places they are subject to occasional and light overflow and deposition.

Lindside silt loam (Ls).—The profile of this soil is the ame as the profile described as typical for the series.

This soil is used mostly for pasture or hay, but corn and small grain also grow well. The soil is productive and has high available moisture capacity. Ash, sycamore, hickory, white oak, red oak, and tulip-poplar grow well

The soil is in capability unit IIw-2; woodland group 8; and group 13 for building sites.

Made Land

Made land consists of areas in which the soil has been covered by other materials or from which the soil has been moved about or removed to provide materials for urban or industrial development. Because the areas consist of variable materials, they have not been given a capability classification or a woodland suitability classification. They have, however, been included in the groups for building sites.

Made land, gravelly materials (Ma).—This miscellanes land type consists of areas in which the profile of the normal soil has been destroyed or covered by earthmoving equipment used for urban or industrial development. In these areas the soil materials consist of sand, gravel, and clay in various mixtures, but gravelly materials predominate. This mapping unit is in group 1 for building sites.

Made land, silt and clay materials (Mc).—This miscel-

laneous land type consists of areas in which the profile of the normal soil has been destroyed or covered by earthmoving equipment. In most places the exposed materials consist of silt and clay, but small areas of sandy and gravelly materials are intermingled with the silt and clay. This unit is in group 3 for building sites.

Made land, gabbro and diabase materials (Md).— This miscellaneous land type consists of areas that have been graded or filled and the profile of the normal soil destroyed or covered. Large, grayish-brown boulders of diabase, and coarse-grained, salt-and-pepper colored boulders of gabbro make up most of the mass of material; the rest consists mainly of a mixture of reddish silty clay cam or clay from the subsoil and gray to brown silt loam from the surface layer. This mapping unit is in group 3 for building sites.

Made land, schist and gneiss materials (Me). - This miscellaneous land type consists of areas in which the profile of the normal soil has been destroyed or covered by earthmoving equipment used for urban or industrial development. In these areas the soil material consists of a mixture of grayish-brown material from the surface layer, silt loam from the subsoil, and partially weathered micaceous schist and gneiss rocks. This unit is in group 1 for building sites.

Made land, sanitary land fill (Mf).—This miscellaneous land type is made up of alternate lavers of soil material and trash and has been compacted by heavy equipment. It is in group 5 for building sites.

Manor Series

The Manor series consists of shallow, well-drained soils of uplands. The soils occur in both Chester and Delaware Counties, but in Chester County they are more common south of Chester Valley. The parent material of these soils is mostly mica, schist, and gneiss. The schist is fairly soft and weathers easily. The soils formed on schist appear to be deep, but, actually, they have little development in the B horizon. The soils formed on gneiss are shallow over bedrock in many places.

The Manor soils have a dark-brown surface layer. Their subsoil is yellowish red or yellowish brown and is micaceous. In many places the soil has a slippery or greasy feeling caused mainly by the abundance of mica that it contains. The native forest consisted mostly of red oak, white oak, chestnut, hickory, black oak,

tulip-poplar, and beech. The Manor soils are near the deep, well-drained Chester soils and the moderately deep, well-drained Glenelg soils. They are also near the Glenville and Worsham soils, but they are shallower and better drained than those soils.

Typical profile of Manor loam, 8 to 15 percent slopes. moderately eroded:

- A. 0 to 7 inches, dark-brown (10YR 4/3) loam; weak, fine, granular structure; very friable; very strongly acid (pH 5.0); clear, smooth lower boundary; 6 to 8 inches thick.
- 7 to 13 inches, yellowish-red (5YR 4/8) loam; weak, fine, granular structure; friable: strongly acid (pH 5.2); gradual, wavy lower boundary; 5 to 8 inches thick. 13 to 21 inches, yellowish-brown (10YR 5/6), smooth loam; weak, fine, subangular blocky structure; friable;
- strongly acid (pH 5.4); gradual, wavy lower boundary; 8 to 12 inches thick.
- 21 to 50 inches, dark yellowish-brown (10YR 4/4) very fine sandy loam containing yellow (10YR 7/8) lenses that are % inch thick; weak, medium, somewhat platy structure that breaks to weak, fine, granular structure; loose to very friable; medium acid (pH 5.6).

The texture of the surface layer is loam or light silt The color of the surface layer ranges from pale brown to dark grayish brown, and that of the subsoil, from yellowish brown to reddish brown. Depth to bedrock ranges from 15 inches in some places that are underlain by gneiss to between 8 and 10 feet in soils that are underlain by mica schist.

In most places the subsoil is very micaceous and is underlain by highly weathered mica schist. The mica schist is interspersed with partially disintegrated frag-ments of rock. In some areas near South Valley Hills, where the underlying rocks are albite-chlorite schist, 40 to 60 percent of the profile, by volume, consists of fragments of schist. The fragments vary in size. They are as much as 3 or 4 inches across and 1/2 inch to 2 inches

Manor loam, 0 to 3 percent slopes, moderately eroded (MgA2).—In this soil depth to the C horizon is greater than in the profile described as typical for the series. In most places, however, part of the original surface layer has been lost through erosion. In a few places the surface layer has been removed for use as casing soil in mushroom houses.

Manor loam, 0 to 3 percent slopes, moderately eroded, is easy to work. It has moderate to low available moisture

capacity, and its productivity is moderately low.

If this soil is managed properly, most farm crops grow fairly well on it. Contour cultivation is needed to help control erosion. A cropping system is needed in which grasses and legumes are grown every 3 or 4 years. Large amounts of lime and fertilizer are required. Red oak, black oak, chestnut oak, hickory, and tulip-poplar grow well on this soil.

The soil is in capability unit IIs-1; woodland group

13; and group 5 for building sites.

Manor loam, 3 to 8 percent slopes, moderately eroded (MgB2).—Except that depth to parent material is greater, the profile of this soil is similar to the one described as typical for the series. The soil has lost about 50 percent of its original surface layer through erosion.

Most of this soil is easy to work. It has moderate to low available moisture capacity and is moderately to

highly permeable.

This soil is moderately well suited to the general farm crops grown in the area. Contour stripcropping and diversion terraces will help to control erosion. Growing a sod crop of grasses and legumes at least 50 percent of the time also helps to control erosion and increases the supply of organic matter in the soil. Red oak, white oak, black oak, tulip-poplar, and hickory grow well on this soil.

The soil is in capability unit IIe-5: woodland group 13:

and group 5 for building sites.

Manor loam, 3 to 8 percent slopes, severely eroded (MgB3).—This soil has lost nearly all of the original surface layer through crosion, and part of the subsoil has been mixed with the remaining surface soil. Otherwise, the profile is similar to the one described as typical for the series. In a few places the surface layer has been removed to provide casing soil for use in mushroom houses.

This soil can be used for small grain, but it is better suited to hay or pasture. If the soil is cultivated, it should be tilled on the contour to help control erosion. Diversion terraces would be needed. The soil is well suited to a permanent cover of hay or pasture. Large amounts of fertilizer and lime are needed for adequate yields. The lime and fertilizer should be applied according to the needs indicated by soil tests. Red oak, black oak, chestnut oak, and hickory grow fairly well on this soil.

The soil is in capability unit IIIe-4; woodland group

13; and group 5 for building sites.

Manor loam, 8 to 15 percent slopes (MgC).—Most of this inextensive soil is wooded. It has a layer of leaf mold, about 1 inch thick, on the surface. Just beneath the leaf mold is an A_1 horizon, 2 inches thick, of dark grayish-brown loam that is very friable and contains many roots. The A₂ horizon, underlying the A₁, consists of dark-brown silt loam, 4 to 6 inches thick that contains 15 to 20 percent, by volume, of fragments of schist. The

profile underlying the A, horizon is simple to the described as typical for the series except that the de to parent material is between 20 and 24 inches.

This soil is moderately permeable and has moder available moisture capacity. If cleared, it is well suto hav or pasture. Its use for row crops and small gr is limited. If this soil is used for tilled crops, cont stripcropping and diversion terraces are needed to conerosion. A hay crop is needed 2 years out of 4 to 1 maintain organic matter in the soil. Red oak, black o white oak, beech, chestnut oak, and hickory grow fa well on this soil.

The soil is in capability unit IIIe-4; woodland gre

15; and group 6 for building sites.

Manor loam, 8 to 15 percent slopes, moderately eros (MgC2).—The profile of this soil is the one described

typical for the series.

This soil is fairly well suited to the general farm cr grown in this area. Its available moisture capaci however, is moderately low to low. During dry peric crops grown on this soil are among the first in the a

to be damaged by lack of moisture.

The soil is well suited to permanent pasture. If i used for cultivated crops, contour stripcropping : diversion terraces are needed to help control erosi Growing a sod of grasses and legumes 50 percent of time also helps to control erosion and adds organic mat to the soil. Red oak, white oak, black oak, bickory, a beech grow well on this soil.

The soil is in capability unit IIIe-4; woodland group

and group 6 for building sites.

Manor loam, 8 to 15 percent slopes, severely eroc (MgC3).—The profile of this soil is shallower, in m places, than the profile described as typical for the ser Nearly all of the original surface layer has been was away, and material from the upper part of the subsoil l been mixed with the remaining surface layer. Gullies

In several places the surface layer of this soil has be removed to provide casing soil for use in mushroom hous In these areas gullies form soon after the surface laver removed unless practices are applied immediately

protect the soil.

This soil needs a permanent sod of hay or pasture help control erosion. To obtain a satisfactory cov lime and fertilizer should be applied before seedi according to the needs indicated by soil tests. Black or chestnut oak, red oak, beech, and hickory are suited.

This soil is in capability unit IVe-4; woodland gro

15; and group 6 for building sites.

Manor loam, 15 to 25 percent slopes (MgD).—This is nearly all forested. On the surface is a layer of leading to the surfac mold about I inch thick. Just beneath the leaf mold i layer of dark grayish-brown loam, about 2 inches this that is very friable and contains many roots. Underlyi this layer is an A₂ horizon, 4 to 6 inches thick, of day brown silt loam that contains 15 to 20 percent, by volum of fragments of schist. The profile below the A2 horiz is similar to the one described as typical for the series.

This soil has moderately low available moisture capaci It is easily penetrated by air, moisture, and plant roo

Because of its strong slopes and susceptibility to e sion, the soil is not well suited to cultivated crops. T soil needs a permanent cover of sod or trees. If it cleared for pasture, a large amount of lime and fertilize

orded for satisfactory yields. White oak, red oak, heech, hickory, and tulin-norder or oak, heech, hickory, and tulip-poplar are suited to

the sail is in capability unit IVe-1; woodland group

and group 6 for building sites. lignor loam, 15 to 25 percent slopes, moderately eroded The profile of this soil is shallower than the mile described as typical for the series, but, otherwise, Most of this soil is wooded or in pasture. In array that have been cleared, between 50 and 75 percent in array that surface layer has been lost than 175 percent In areas that have face layer has been lost through erosion.
This soil is well suited to permanent hay or pasture. In and fertilizer are required to obtain adequate yields. Red oak, white oak, black oak, beech, tulip-poplar, and Red cars, the dominant kinds of trees that grow on this

This soil is in capability unit IVe-4; woodland group and group 6 for building sites.

Maser loam, 15 to 25 percent slopes, severely eroded (D3).—The profile of this soil is shallower than the described as typical for the series, and gullies are common. Practically all of this soil has been cleared and rescultivated at one time. Permeability is moderately high, but the available moisture capacity is low.

This soil is not well suited to corn or small grain, but it hairly well suited to permanent pasture or trees. Large ansumts of fertilizer and lime are needed for plants to grow vigorously. White pine, Virginia pine, Banks pine, and pitch pine are suited to this soil.

The soil is in capability unit VIe-2; woodland group 15;

and group 6 for building sites.

Manor loam and channery loam, 25 to 35 percent slopes The profile of this soil is shallower over bedrock than the profile described as typical for the series, and there is a mat of leaves, about 1 inch thick, on the surface. The mat is underlain by a layer, 6 to 7 inches thick, of ravish-brown loam that has granular structure. This laver contains many fragments of rock that occupy from in to 60 percent of the soil mass. The profile beneath this horizon is similar to the profile described as typical

This soil has not been cleared and is used as woodland. It is well suited to trees. If cleared, it has only a limited or for pasture. Red oak, white oak, black oak, chestnut rak, beech, and hickory grow fairly well on this soil.

This soil is in capability unit VIe-2; woodland group 17; and group 9 for building sites.

Manor loam and channery loam, 25 to 35 percent slopes, severely eroded (MhE3).—The profile of this soil is shallower over bedrock than the one described as typical for the series. It is shallow to very shallow. The present surface layer is mostly material from the former subsoil. In a few places bedrock is near the surface, and there are a few rock outcrops. In a few other areas, 40 to 60 percent of the profile consists of fragments of rock. The number of rocks increases with increasing depth.

This soil is probably best suited to use as woodland. has steep slopes, is droughty, and is low in fertility. Furthermore, the areas are inaccessible to farm machinery, and erosion is difficult to control. White pine, red pine, Virginia pine, Banks pine, and pitch pine grow fairly well on this soil.

The soil is in capability unit VIIe-1: woodland group 17; and group 9 for building sites.

Manor soils, 35 to 60 percent slopes (MkF). soils are shallow. Most of the areas are wooden and have a thin layer of leaf mold, about one-half inch'thick, on the surface. In most places the soils are only slightly to moderately eroded, but a few areas have been cleared and have become severely eroded. There are numerous fragments of rock in the surface layer and throughout the profile. In eroded areas the subsoil is very thin. available moisture capacity is fairly low, but permeability is rapid to very rapid.

These soils are not suited to cultivated crops or pasture. They are well suited to trees, which are needed to provide a permanent cover. Red oak, white oak, black oak, chestnut oak, beech, and hickory grow fairly well on these soils if the areas are not severely eroded. In areas that are severely eroded, red pine, Virginia pine, Banks pine,

white pine, and pitch pine can be grown.

This soil is in capability unit VIIe-1; woodland group 17;

and group 9 for building sites.

Manor very stony loam, 0 to 8 percent slopes (MmB).-Except that it is stony and is thicker, 20 to 24 inches to the C horizon, the profile of this soil is similar to the one described as typical for the series. There is a layer of leaf mold, about 1 inch thick, on the surface. The leaf mold is underlain by a layer, 2 to 3 inches thick, of dark grayish-brown loam that contains many small roots. Beneath this layer is the A. horizon, which is 4 to 8 inches thick and consists of dark-brown silt loam that contains a few fragments of schist.

The many large stones on the surface make this soil unsuitable for cultivation. In some places, however, the soil has a limited use for pasture. Red oak, white oak, black oak, beech, and hickory are fairly well suited.

This soil is in capability unit VIIs-1; woodland group 13;

and group 5 for building sites.

Manor very stony loam, 8 to 25 percent slopes (MmD).—This soil has a thin layer of leaf mold, about 1 inch thick, on the surface. Just beneath the leaf mold is a layer, 1 to 2 inches thick, of dark grayish-brown loam that is very friable and contains many roots. Underlying this layer is an A₂ horizon, 5 to 7 inches thick, of dark-brown silt loam that contains, by volume, 15 to 20 percent of fragments of schist. The profile beneath the A horizon is similar to the one described as typical for

The many large stones on the surface and in the profile of this soil make cultivation impractical. Some areas, if cleared, can be used for pasture, providing the stones are not so numerous as to prevent the control of woody and undesirable kinds of plants. White oak, red oak, black oak, tulip-poplar, hickory, and beech are well suited to this soil.

This soil is in capability unit VIIs-1; woodland group

15; and group 6 for building sites.

Manor very stony loam, 25 to 60 percent slopes (MmF).—This soil has a thin layer of leaf mold, about 1 inch thick, on the surface. The leaf mold is underlain by 1 to 2 inches of dark gravish-brown loam that is very friable and contains many small roots. Just beneath this layer is a horizon, 3 to 6 inches thick, of dark-brown silt loam 20 to 25 percent of which, by volume, consists of fragments of schist. Depth to the C horizon ranges from 15 to 20 inches.

The many large stones make this soil unsuitable for cultivation or for use as pasture. The soil is probably



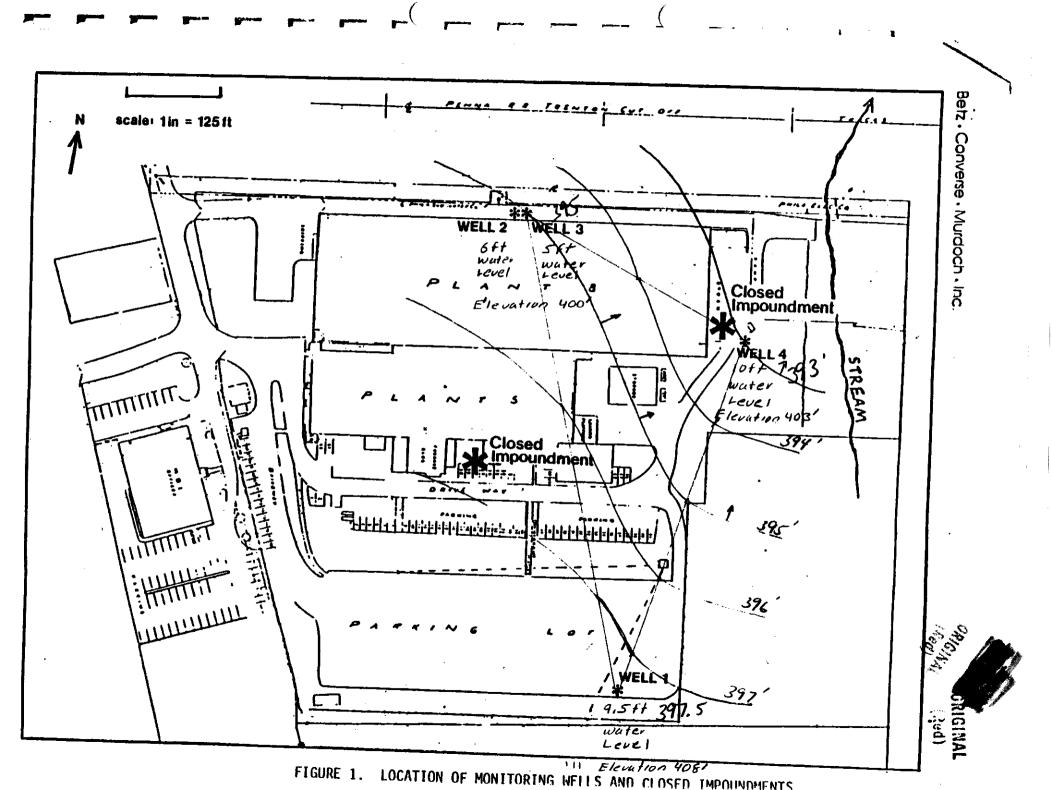
APPENDIX G



** Hyprogeologic Stupy, Blattop Tube Co., Prazer, PA. ** Hyprogeologic Stupy, Blattop Tube Co., Oct. 1981

. 9 HELKINGT	Liwetell	गण ्ल अज्ञास	SYSTEM, CH	שמשור אינות אות אות אות אות אות אות אות אות אות א	* [4]
	-	- #TTE - 410		\$,000,€√	METANCE STE OT
•	_	<u></u>	21	7	WARE
• -	-	_	96	8 }	test to make the second of the
		CEASHTA	•	1	Septement .
86	8)	E)	50	Ь	OT HT PA
ane Lineanuc	07 <u>68</u> M]_	-SHOTE SHOLLS	₇ w+92	Temasim Temas	Herena Herenan
bellow 13, Even	HERING BATTOM	g, Gren	Helles Med	den	C(EE)
279, L	349'8	ार् <i>जि</i> र	30, bic	/c	Church
+	→	7	b	9	Dynamies (IN)
96	-2.51	42	84	201	WELLDERH (F.)
		12. 35, 40. 05, 1		40.4, PD." 40.4, PD."	अधारमात्रा अधारम्भारा दे
	- 80	STEHOP WEE		MSALF . C	SOUNES
+ #	€ #	# of ##.	eustonueut +	* Figs	WELL NO.





of Water, Leallon Beiler Tetal Depth 23 feet 16 feet feet to water Readings in the diepped to Eppingon Anticit was background CATE CAPINIOS PEOLE OF 6 PPM HVU GEORINGS IN 60 PE IN OBJUST C# 0511 1130) 1 # 110M 5011 10 E) 7611 cut off 5)/8:13 क/ज Bails with 1 60/61 Bail 82 Gallers for Each Volume भिटेग् गयग्. 54 gri Drino2 feet to conte 5.6 Backg Could Reading 4,10,d M.D المحد لجددد بدر وراده ور // 301 HOW readings with LOUD CONSTORE 0/11 5 11 DE 11 6 1100 1#

Mell #	well # 3 inclining found inclining to water o' column of water = 6 callens it colles to be it colles to
--------	--

S velunce

7

CC. Hoils

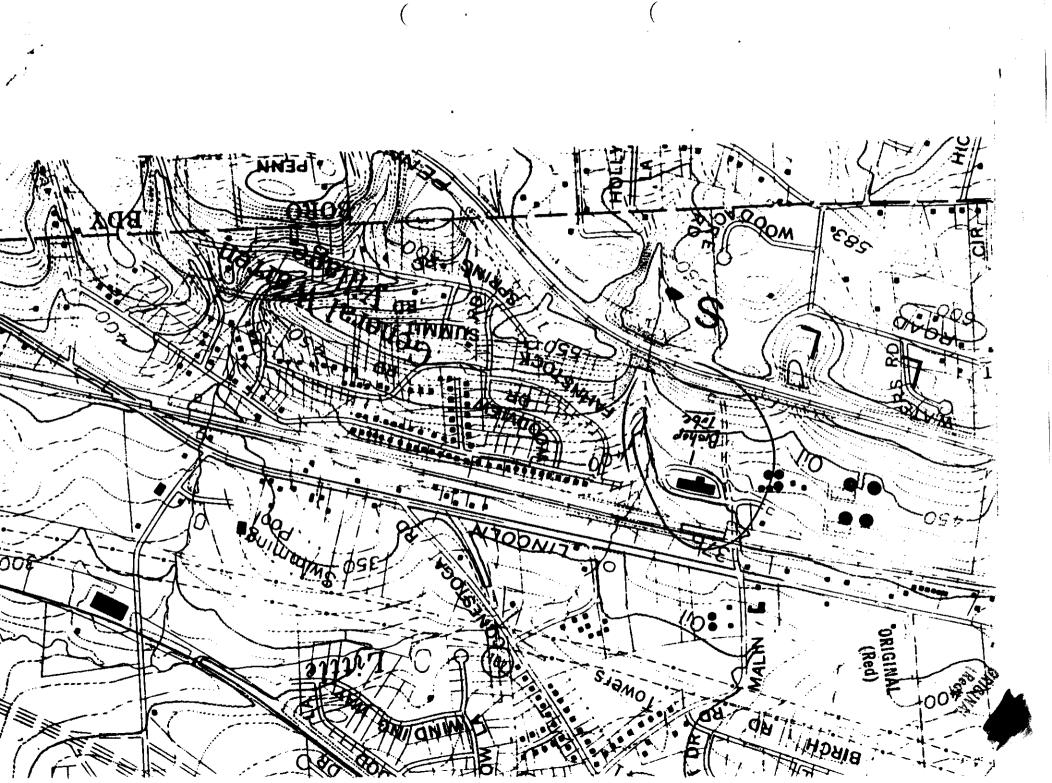
13e

130 1500 Mg

Po

ω 0

Landwicker



NUS CORPORATION

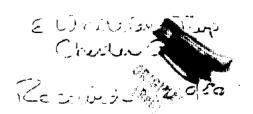
TELÉCON NOTE

				,		URIGINAL
CONTROL NO:	DATE:	las	March 25, 1985	TIME:	:30	11
F3-8405-15	111040	7		<u></u>		
DISTRIBUTION:						
					· · · · · · · · · · · · · · · · · · ·	
BETWEEN:		U	Malvern Public	F	HONE:	
IRA Dutton		WOI	s Foreman	}	(2	15 644-1859
AND:						
(b) (4)						(NUS)
DISCUSSION:			· · · · · · · · · · · · · · · · · · ·		,	
	for to	4-	Bara of Mal	سره در را	,	and and
The water supply for the Boro of Malvern is secured						
by 5 springs and	3 W	1/5	. The well	ls a	<u> </u>	40, 190 and
196 feet deep in the Wissohicken Formation off of						
Ruthland Road off of King Street located 21/4 miles to						
the southeast of the subject site.						
THE SOUTHERST OF	7.4 <u>30</u>	10/56	<u> </u>			
			,			
ACTION ITEMS:						
						
						<u></u>



APPENDIX H

PROPOSAL



TO

BISHOP TUBE COMPANY MALIN ROAD FRAZER, PA 19355

FOR

HYDROGEOLOGIC STUDY

BCM PROPOSAL NO. 13-8326-41R

MAY 2, 1980

PREPARED BY:

(b) (4)

SENIOR GEOLOGIST

BETZ-CONVERSE-MURDOCH-INC. ONE PLYMOUTH MEETING MALL PLYMOUTH MEETING, PENNSYLVANIA 19462 .z.Converse.Murdoch.lnc.
BISHOP TUBE COMPANY



INTRODUCTION

Bishop Tube Company of Frazer, Pennsylvania has been instructed by the Pennsylvania Department of Environmental Resources (PA DER) to retain a consultant to conduct a study of groundwater conditions in the vicinity of their plant site. In the past, Bishop Tube and its former owners discharged sanitary sewage, cooling water, and acid pickling rinse water to an unlined pit and cesspool located on plant property. Over the past 1-1/2 years, these discharges were diverted to a sanitary sewer, a nearby stream, and holding tanks. Consequently, the use of the pit and cesspool was discontinued.

SCOPE OF WORK

Betz-Converse-Murdoch-Inc. (BCM) proposes the following scope of work to complete the hydrogeologic study at the Frazer site:

1. <u>Initial Data Collection</u>

A BCM geologist will collect pertinent data at the site relative to past disposal practices, existing wells and core boring records. The number of required monitoring wells and their location will be established.

2. Monitoring Well Installation

BCM will subcontract with a reputable well driller to install monitoring wells at locations established in Section 1.

A BCM geologist will supervise installing the monitoring wells and will inspect and certify their construction and the nature of subsurface conditions. It is assumed that three (3) monitoring wells will be required.

Water Sampling

BCM will collect water samples from the following locations:

- Existing wells east and west wells
- Monitoring wells
- Discharge junction box and discharge outlet
- Stream Above and below discharge outlet

.z.Converse.Murdoch.lnc.
BISHOP TUBE COMPANY

1930 1930 1930 1930

The samples will be analyzed for the following parameters:

Nitrate Ammonia Zinc Fluoride Chromium Manganese

Iron Nickel pH

Temperature

Samples will be collected once from each sampling point. If additional sampling is required, it will be done on a per diem basis, plus expenses. These parameters and sampling locations have been designated by the PA DER Bureau of Water Quality Management staff member assigned to follow-up on this investigation.

4. Report

A draft final report will be prepared and submitted to Bishop Tube upon completion of the study. This report will include an Introduction, Methods, Results, Conclusions, and Recommendations. BCM will meet with Bishop Tube to discuss the report, and to subsequently prepare a final report suitable for submission to PA DER. A meeting with the DER is also included under this task.

5. <u>Discharge Pipe Flow Measurement (Optional)</u>

At the discretion of the Bishop Tube Company, BCM will measure flows in the discharge pipe between the junction box and the discharge outlet. These measurements will determine if groundwater is leaking into the pipe in that interval, thereby degrading the quality of the discharge to the stream.

QUALIFICATIONS AND EXPERIENCE

BCM has the qualifications and experience necessary to perform the full range of work required for the completion of this hydrogeologic study. BCM's staff of geologists has supervised the installation of numerous monitoring wells and has completed the hydrogeologic interpretation of subsurface conditions and groundwater flow patterns. Hydrogeologic studies completed by BCM have also included groundwater sampling and negotiations with the PA DER on behalf of our clients.

The BCM geologists assigned to this study are Robert D. Buller, Senior Geologist, and William S. Neubeck, Geologist/Hydrologist. Mr. Buller has completed over twenty hydrogeologic studies in his seven years with BCM. He will be actively involved in all aspects of the project. Mr. Neubeck has extensive experience in the supervision of well drilling and sampling and will play an integral role in similar activities for this study. BCM's experienced technicians would perform the discharge pipe flow measurements, if that option is selected. Resumes of participants are attached.



MIERS C. JOHNSON PROJECT ENGINEER

> A DIVISION OF CHRISTIANA METALS CORPORATION

BEPORU.





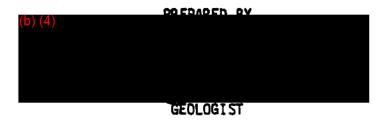
HYDROGEOLOGIC INVESTIGATION

FOR

BISHOP TUBE CORPORATION ROUTE 30 AND MALIN ROAD FRAZER, PENNSYLVANIA 19355

OCTOBER 1981

BCM PROJECT NO. 00-5265-01



APPROVED BY

ASSISTANT VICE PRESIDENT

BETZ-CONVERSE-MURDOCH-INC. ONE PLYMOUTH MEETING MALL PLYMOUTH MEETING, PENNSYLVANIA 19462

Betz · Converse · Murdoch · Inc.



CONTENTS

1.0 BACKGROUND			
	1.1 General1.2 Monitoring Well Installation1.3 Monitoring Well Sampling Method	1 1 1	
2.0	PRESENTATION OF DATA	3	
3.0	DISCUSSION OF RESULTS	3	
	3.1 Groundwater Quality 3.2 Surface Water Quality 3.3 Deep Groundwater Quality	3 6 6	
4.0	SUMMARY OF FINDINGS	6	
5.0	CONCLUSIONS AND RECOMMENDATIONS	7	
	5.1 Conclusions 5.2 Recommendations	7 8	
APPE	ENDICES		

Appendix 1 Well Logs Appendix 2 USGS Report on East Well

Betz - Converse - Murdoch - Inc.



TABLES

Table 1	Analytical Results for Samples Collected July 31, 1981	4
Table 2	Chester County Health Department Well Water Standards for Collected Parameters	Ę

FIGURES

Figure 1 Locations of Monitoring Wells and Closed Impoundments 2

oct 1981



1.0 BACKGROUND

1.1 General

54

113

The Bishop Tube Company operates a stainless steel tube manufacturing plant in Frazer, Pennsylvania. The Pennsylvania Department of Environmental Resources (DER) instructed Bishop Tube to conduct a hydrogeologic study of surface water and groundwater conditions at the plant. Betz·Converse·Murdoch·Inc. (BCM) of Plymouth Meeting, Pennsylvania, was retained to conduct the investigation, which was performed with the approval of the DER. This report describes the work performed and the results obtained, and contains recommendations for future action.

1.2 Monitoring Well Installation

Between June 3, 1981 and June 5 1981, four monitoring wells were installed on the plant site by Thomas G. Keyes, Inc. under the supervision of a 8CM geologist. The well locations are shown in Figure 1; copies of the original well logs are contained in Appendix 1.

Well 1, which serves to monitor background groundwater quality conditions, is finished in the Wissahickon Schist, a lower Paleozoic metamorphic formation. Wells 2 and 4 are finished in colluvium, alluvium, or residual soils above the Conestoga Formation, an Ordovician limestone containing minor amounts of shale and phyllite. Well 2 extends into the Conestoga Formation to a depth of 24 feet. Wells 2 and 3, located on the north side of Plant Building 8, are 24 feet and 13.5 feet deep, respectively. Well 3 monitors the uppermost water-bearing zone, and Well 2 monitors a lower, apparently separate, water-bearing zone. The locations of Wells 2, 3, and 4 were selected, with the DER's agreement, to be the closest feasible downgradient sites to the deactivated and closed waste impoundments identified in Figure 1.

1.3 Monitoring Well Sampling Method

On June 16, 1981, all four monitoring wells were sampled. Because of the generally turbid conditions of the water samples, the wells were resampled on July 31, 1981. A standard procedure was followed, using a submersible pump to purge the wells and collect the samples. Also, to eliminate the uncertainties that arise from the turbid samples, all samples were filtered through an 0.45 m filter using a vacuum pump before filling the pre-fixed bottles.

All samples were transported immediately to the BCM laboratory in Norristown, Pennsylvania, where they were analyzed.

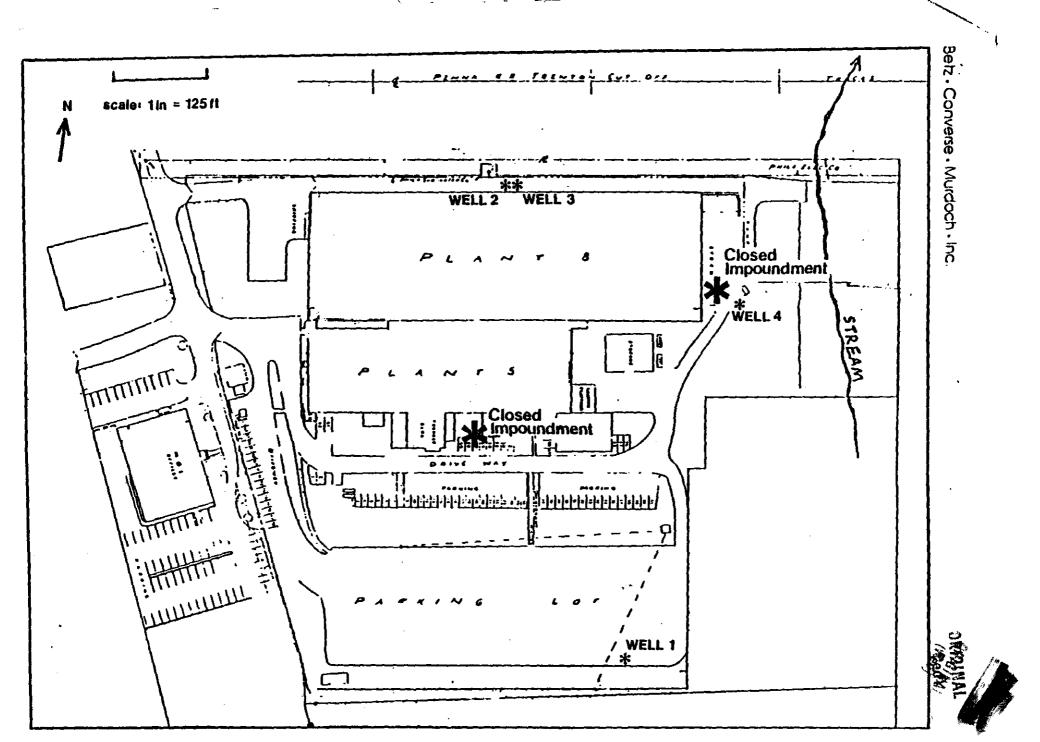


FIGURE 1. LOCATION OF MONITORING WELLS AND CLOSED IMPOUNDMENTS

TABLE 1

AMALYTICAL RESULTS FOR SAMPLES COLLECTED JULY 31, 1981

(All values except pH in mg/l)

	Sampling Station							
Parameter	Well 1	Well Z	Well 3	Well 4	Upstream	Discharge	Downstrea	
Total Dissolved Solids	63	303	151	353	144	205	156	
Copper	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	
Aluminum	<0.250	<0.250	<0.250	4.10	<0.250	<0.250	<0.250	
Zinc	0.057	0.050	0.050	0.065	0.046	0.073	0.046	
Chronium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Hanganese	<0.014	2.22	<0.014	2.10	<0.014	<0.014	<0.014	
Iron	0.054	1.01	<0.040	.173	<0.040	<0.040	<0.040	
Nickel	<0.10	<0.10	<0.10	0.454	<0.10	<0.10	<0.10	
Chemical Oxygen Demand	1	34	16	· 19	6	5	4	
Mitrate - Mitrogen	6.77	<0.10	0.05	7.22	2.76	2.22	2.72	
Ammonia - Nitrogen	0.02	0.16	0.10	2.1	0.02	0.12	0.07	
Fluoride	<0.10	0.2	0.5	23.1	0.2	1.0	2.2	
pH	6.3	7.4	8.7	6.8	7.3	7.8	7.5	

A COLUMN TO THE PARTY OF THE PA



3.2 Surface Water Quality

Table 1 presents the data on the water quality samples taken from the Bishop Tube cooling water discharge and two sampling stations on the unnamed stream—one upstream and one downstream. The purpose of sampling these three points was to determine if there is a significant difference in stream water quality between the upstream and downstream points that can be attributed to the cooling water and/or groundwater discharge.

A comparison of the data from the three stations shows that only the fluoride concentration increases significantly between the upstream station and the downstream station. The 1.0 ppm of fluoride in the cooling water discharge probably is partially responsible for this increase, but it cannot completely account for the 2.2 ppm at the downstream station. Some of the fluoride contribution probably is from recharge by groundwater (that contains 23.1 ppm fluoride near Well 4).

3.3 Deep Groundwater Quality

The quality of groundwater at a depth of 300 feet below the ground surface has been determined by U.S. Geologic Survey (USGS) personnel who sampled Bishop Tube's east well on June 3, 1981 as part of a county-wide USGS study. The USGS report is contained in Appendix 2.

The USGS analyses show that all concentrations of constituents studied to be lower than the Chester County Health Department standards presented in Table 2, except for fluoride. The fluoride concentration in the well was 1.0 ppm. This level is within the range of acceptable limits, and is approximately at the recommended concentration for intentionally-fluoridated water.

It is not clear from the available data if the east well is monitoring groundwater that is potentially affected by the plant operations or if the well takes water that is upgradient from the plant. It is possible that the values shown in the USGS report are representative of regional background levels.

4.0 SUMMARY OF FINDINGS

1. Compared to background conditions (as shown in Well 1) and drinking water standards, the groundwater beneath the site exhibits no contamination for most of the parameters.



- 2. Well I exhibits generally high quality water representative of background conditions. Elevated nitrate levels are the result of upgradient influences off Bishop Tube property.
- 3. Well 2 exhibits levels of iron and manganese in excess of background conditions as measured in Well 1. It appears that these levels do not represent natural background conditions.
- 4. Well 3, which monitors the shallow groundwater zone on the north side of the plant, exhibits no contamination. No contaminants are present in this well near levels of concern.
- 5. Well 4 exhibits elevated concentrations of fluoride, aluminum, manganese, iron, and nickel above background levels.
- 6. With the exception of fluoride, the surface water samples, including the cooling water discharge, showed no problems that warrant further investigation. The fluoride levels at the downstream sampling station suggest that fluoride is being added to the stream from the cooling water discharge and from groundwater discharge.
- 7. The deep groundwater beneath the site exhibits no significant contamination. The highest value is for fluoride, which, at 1.0 ppm, is within the range of acceptablility for fluoridated drinking water.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

1

7

73

- 1. The groundwater near Well 4 is moving towards, and discharges into, the unnamed stream. This is evident by the increase in fluoride concentration in the stream that cannot be attributed to the cooling water discharge. In recharging the stream, the fluoride-enriched groundwater becomes greatly diluted by the stream water.
- 2. The groundwater conditions at Bishop Tube are not a hazard to public health. The area of high fluoride concentrations is probably limited to the immediate vicinity around Well 4 and adjacent parts of the stream. The stream is not used for water supply and it shows significantly lower values for all parameters. The nearest public water supply well is about 1.5 miles away. Any surface or groundwater traveling from the Bishop Tube area to the public well would be diluted by several orders of magnitude before it was taken up in the well, and should be within drinking water standards.



Betz · Converse · Murdoch · Inc.

3. It is possible that the groundwater near Well 4, which was monitored in the overburden, could move downward into the limestone. If this were to happen, any contamination in the groundwater would become very diluted before being taken up in any public water supply well.

5.2 Recommendations

Based on the conditions described previously, the surface and groundwater quality at the Bishop Tube site should be periodically monitored. This monitoring should include sampling water from the stream and from all four wells, as before. The samples should be analyzed for the key parameters shown to be important: fluoride, iron, manganese, aluminum, and nickel. This periodic monitoring will determine if changes in the system occur over time. Further action beyond this is not warranted at this time.

Betz • Converse • Murdoch • Inc.



APPENDIX 1

WELL LOGS

Betz · Converse · Murdoch · Inc. | E





WELL NUMBER: 1 Background	WELL OWNER: Bis	hep Tube
LOCATION: upper parking lot	ADORESS: Mal	vern PA
-11-1-3	ТОТАL DEPTH: <u>4</u>	,
	TOTAL DEPTH:	15/6//
SURFACE ELEVATION:	STATIC WATER LEVEL	: 15 6" DATE: 6-3-4
DRILLER:	DRILLING METHOD: _	•
COMPANY: Thomas Keyes	DATE DRILLED: 6-	3-81 START 0813
Malvern, PA		STOP . 0915
1.0GGED BY	SKETCH MAP	 :
COMMENTS:		•
		
	•.	
	LOCATION:	
SAMPLES	·	
EAST 10 SOUN		. 5
THE SPOON LESS SO NUMBER BLOWS	DESCRIPTION OF MATERIAL	5 Wissahickan Schist
	st: mica quartz pobbles	It brown dry iron stains
	stered waited a few mi	
30' hit water a a		
48' total depth 1		
	sample taken at 30ft	-
- - - - - - - - - - - - -	ample laken at 304)	
	· + -	. 11 101 1 1 1
		48' to 28 gravel packed
30' of 4" PV	c pipe: set above	
	(b) (A)	1
	(b) (4)	

Beiz · Converse · Murdoch · Inc.

DRILLING LOG

JWL	
	it

WELL NUMBER: 2 Downgradint	WELL OWNER: Bishop labo
LOCATION: N side of maindent building	ADDRESS: Maluson Pa.
approx midney and willing ~ 5' for brill	TOTAL DEPTH: 24'
SURFACE ELEVATION:	STATIC WATER LEVEL:DATE:
DRILLER:	DRILLING METHOD: air rotary, air hammer
COMPANY: Thomas Keynes	DATE DRILLED:
Maluera Da	
LOGGED BY:	SK ETCH MAP
COMMENTS:	Section 1100
•	
(E2)	LOCATION:
ر کی ت تقیری SAMPLES	
EZZ.I.D. SPOON	
	ESCRIPTION OF MATERIALS
G-13) Arrytany Weather D Irrestors es	oritaniliasinordis
(G-137) Weather of Irrustons a	nd schist (?), the weather all medou Freymonb
. watere moisture enca	introdut 8'
13-19/2) 6" Lineston, blue-grey, pl	
195-28 Jairnamer Samelithologias above, in	nuchvala
95 5 14 70 15	10 21/101 D 1 11/
	of from 24-15', grave Deachard to 14'
	-8', cuttings to 1', comunt to surface
15 PVC pip set fi	
Development time	25mm on 6/5/81

Betz · Converse · Murdoch · Inc.



DRILLING LOG

BOM	
	ORIGINAL
	(0:0)

WELL NUMBER: 3 Downgradien!	WELL OWNER: Dishop lub
LOCATION: <u>Herde of main deat building</u>	ADDRESS: Prozie Pa
approx. 4' Fof wollt2	TOTAL DEPTH: 13.5
SURFACE FLEVATION:	STATIC WATER LEVEL: DATE:
OR ILLER:	DRILLING METHOD: Air rotary
COMPANY: Thomas Keynes	DATE DRILLED: C/4/81
Malura, Pa	
_OGGED BY:	- SKETCH MAP
COMMENTS:	-
· ·	LOCATION:
E iii o SAMPLES	
	DESCRIPTION OF MATERIALS
0-1' Roadgravel	
	tpoble w/bran soil natrix, dry
	D, some school Fragments, watnot 8'
	mesters fragments, mester
Fresh Unweathered 1	imastore, bluezvey, Dry
4	
4" DVC screen	136-8', 5 mil packed to 6'
4" PVC pip 81-	to surface, bontonto 6'=1'
cement doscurres	we will be a second of the sec
Developed for 30r	minutes attachably porty du to proplemuloume

Betz • Converse • Murdoch • Inc.





•	WELL NUMBER: 4 Downson Drent	WELL OWNER: Bishoplub
_	LOCATION: Estat plant in Finished product	ADDRESS: TrazinPL
	storageer ~20'Nof 5Ecomostivill	TOTAL DEPTH: 20'
	SURFACE ELEVATION:	STATIC WATER LEVEL: DATE:
	DRILLER:	DRILLING METHOD: Privately
	COMPANY: Thomas Kaynes	DATE ORILLED: 6/5/81
	(b) (4)	
	'LOGGED BY	SKETCH MAP
	COMMENTS:	:
. :		
-		
•	· ·	LOCATION
	(FE	LOCATION:
	SAMPLES E S S S I.D. SPOON E S S S NUMBER BLOWS DESCRIPTION	<u> </u>
	E S E I.D. SPOON E S E ONUMBER BLOWS DESCRIPTION	RIPTION OF MATERIALS
	19-4' Road grave officer line 4-75 More Fill, encountered to	atom fill
1	4-75 More Fill, encountered to	eorstua at 41
•	7.5-20 Combination of linestau+	ohyllite Flakes within a Firmatrix
1		201: 7/
•	4" DVC screening Fra	adu'to 1
1	1 4 Casing 1 10 07	, bentonito da 1', cement dosus fire
1	Developed For ~ 40	PEMPONIA OF LEAST ALICE THE
á	3000 47 7 4 9 U	יאוא, טון שובי
		(b) (4)
-		

Betz - Converse - Murdoch - Inc.



APPENDIX 2

USGS REPORT ON EAST WELL



United States Department of the Interior



GEOLOGICAL SURVEY
Water Resources Division
35 Great Valley Parkway
Great Valley Corporate Center
Malvern, PA 19355

Bishop Tube Route 30 & Malin Road Frazer, PA 19355

Attention: Mr. Chuck Thompson

Dear Mr. Thompson:

Thank you for allowing us to sample your well as part of the Chester County Ground Water Quality Monitoring Program. Enclosed is a copy of the laboratory report. Your well water meets EPA's safe drinking water standards. We may wish to sample your well again in the future as part of the program.

The quantity of dissolved substances in your well water are shown in quantities of milligrams per liter (MG/L) and micrograms per liter (UG/L). One milligram per liter of dissolved substance is equivalent to one part of the substance in one million parts of water. One microgram per liter of dissolved substance is equivalent to one part of the substance in one billion parts of water.

If you have any questions concerning the sampling procedure, please call me anytime at 647-9008. If you have any questions concerning health related problems and contaminants, please call Philip Terry, Chester County Health Department, at 431-6247.

Sincerely,

Charles R. Wood Subdistrict Chief

DKD/cdk Encl.

UNLIED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY CENTRAL LABORATORY ATLANTA, GEORGIA



WATER QUALITY ANALYSIS LAB-ID # 161031 RECORD-# 53682

SAMPLE LOCATION: 2432
STATION ID: 400221075321201 LAT.LONG.SEQ.: 400221 0753212 01
DATE OF COLLECTION: BEGIN--810603 END-- TIME--1100
STATE CUDE: 42 COUNTY CODE: 029 PROJECT IDENTIFICATION: 444209300
DATA TYPE: 2 SOURCE: GROUND WATER GEULDGIC UNIT:
COMMENTS: UNIQUE-#:
OWNER BISHOP TUBE

	ALDRIN, TOT (WATER)	UG/L	<	0.01	LEAD, DIS.	UG/L		1
	ANALYZING AGENCY			80010	LINDANE, TOT (WATER)		<	0.01
	ARSENIC, DISSULVED	UG/L		1	MANGANESE, DISSOLV.	UG/L		1
	BENZENE, TOTAL	UG/L		0.0	MERCURY, DISSULVED	UG/L		0.3
	BROMOFORM, TOTAL	UG/L		- 0.0	METALS DISS CHE-EXT			0
	DMIUM, DIS.	UG/L		1	METHOXYCHLOR T.(WAT)	UG/L	<	0.01
	LARBON TETRA., TOT.	UG/L		0.0	METHYLBROMIDE, TOTAL	-UG/L		0.0
	CHLORDANE, T (WATER)	UG/L	<	0.1	METHYLENE CHLORIDE, T	UG/L		0.0
	CHLOROBENZENE, TOTAL	UG/L		0.0	MIREX, TOT.	UG/L	<	0.01
	CHLORODIBROMG., TOT.	UG/L		0.0	NICKEL, DIS.	UG/L		8
	CHLOROETHANE, TOTAL	UG/L		0.0	PERTHANE, TOT.	UG/L	<	0.01
	CHLOROFORM, TOTAL	UG/L		0.0	PH FIELD	UNITS		7.1
	CHROMIUM, DISSOLVED	UG/L		0	PHENOLS, TOTAL	UG/L		0
	CONFIRMATION ABOVE 2	UG/L		0	SP. CONDUCTANCE FLD	UMHOS		325
	CYANIDE, TOTAL	DET	₹.	DELETED	TETRACHLOROETHYLEN,T	UG/L		0.0
	DDD, TOTAL (WATER)	UG/L	<	0.01	TOLUENE, TOTAL	UG/L		0.0
	DDE, TOTAL (WATER)	UG/L	<	0.01	TOXAPHÈNE, T (WATER)	UG/L	<	0.1
	DOT, TOTAL. (WATER)	UG/L	<	0.01	TRICHLORGETHYLENE, T	UG/L		0.0
	DICHLORUBROMOMETHA, T	UG/L		0.0	TRICHLOROFLUOKOMET, T			0.0
	DICHLORODIFLUGROME, T	UG/L		0.0	VINYL CHLORIDE, TOTA	UG/L		0.0
,	DIELDRIN, T. (WATER)	UG/L	<	0.01	WATER TEMPERATURE	DEG C		12.0
	DSULFAN I TOTAL	UG/L	<	0.01	1,1-DICHLORETHYLEN,T	UG/L		0.0
	EMDRIN, TOTAL (WATER)	UG/L	<	0.01	1,1-DICHLOROETHANE,T	UG/L		0.0
	TTHYLBENZENE, TOTAL	UG/L		0.0	1,1,1-TRICHLOROETH,T	UG/L		0.0
	LUDRIDE, DISSOLVED	MG/L		1.0	1,1,2-TRICHLORDETH,T	UG/L		0.0
٠	GROSS PCBS T (WATER)	UG/L	<	0.1	1,1,2,2-TETECHLURU,T	UG/L		0.0
	GROSS PONS T (WATER)	UG/L	<	0.1	1,2-DICHLURGETHANE,T	UG/L		0.0
	HEPT EPUX, T (WATER)	UG/L	<	. 0.01	1,2-DICHLURGPROPAN,T			0.0
	HEPTACHLOR T. (WATER)	UG/L	<	0.01	1,3-DICHLUROPROPAN, 1	UG/L		0.0
	IRON, DIS.	UG/L		10	12TRANSDICL-ETHYLENE	UG/L		0.0
	<u>.</u>				2-CL-ETHYLVINYLETHER			0.0
					·			-

CONTINUED ON NEXT PAGE

UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY CENTRAL LABORATORY ATLANTA, GEORGIA



WATER QUALITY ANALYSIS LAB-ID # 162811 RECORD-# 58928

JAMPLE LOCATIUN: 2432
STATION ID: 400221075321201 LAT.LONG.SEG.: 400221 0753212 01
IATE OF COLLECTION: BEGIN--810603 END-- TIME--1100
ITATE CODE: 42 COUNTY CODE: 029 PROJECT IDENTIFICATION: 444240300
DATA TYPE: 2 SOURCE: GROUND WATER GEULOGIC UNIT:
COMMENTS: UNIQUE-#:
OWNER BISHOP TUBE

ŧ

CARBON (JTR D)		MG/L MG/L MG/L	80010 0.9 < 0.01 0.14	NITR DISS NH4 AS NH NITR. DIS NH4 AS NH PH FIELD SP. CONDUCTANCE FLO WATER TEMPERATURE	UNITS	0.02 0.03 7.1 325 12.0
1 1	CATIO	DNS		ENA	ONS	
	(MC	5/L)	(MEQ/L)	NITR DIS NO2+N	MG/L) 0,14	(MEQ/L) 0.010
		TOTA	\L		TOTAL	0.010



REFERENCE NO. 17



Christiana Metals Corporation BISHOP TUBE FACILITY Frazer, Pennsylvania

Results of Implementation of Groundwater Remediation Work Plan Phase I

Submitted To: The Pennsylvania Department of Environmental Resources

January 1990





RESULTS OF IMPLEMENTATION OF GROUNDWATER REMEDIATION WORK PLAN PHASE I

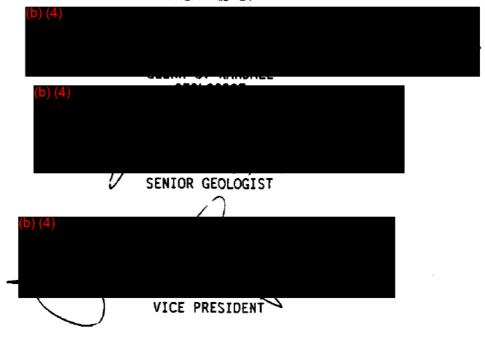
FOR

CHRISTIANA METALS CORPORATION BISHOP TUBE FACILITY FRAZER, PENNSYLVANIA

JANUARY 1990

BCM PROJECT NO. 00-6471-01

PREPARED BY



4598y







CONTENTS

EXEC	UTIVE	SUMMARY	٧
1.0	INTR	DDUCTION	1
		Background Objectives	1 2
2.0	GEOL	OGIC SETTING	4
		Geology/Hydrogeology Soils	4 5
3.0	METHO	DS OF INVESTIGATION	6
	3.2	Test Borings and Soil Sampling Monitoring Well Installation Groundwater Sampling	6 7 8
4.0	RESUI	TS OF INVESTIGATION	10
	4.1 4.2	Soil Sample Analytical Results Groundwater Sample Analytical Results	10 11
		4.2.1 August 29 and 30, 1989, Sample Analytical Results 4.2.2 September 28, 1989, Sample Analytical Results	11 12
	4.3	Hydrogeologic Analysis	12
5.0	DISC	USSION OF RESULTS	14
	5.2	Soil Sampling Results Groundwater Sampling Results Hydrogeology	14 14 16
6.0	CONCL	LUSIONS	17
7.0	RECON	MENDATIONS	18
8.0	REFER	RENCES	19





CONTENTS (Continued)

APPENDICES

Appendix A	Test Boring Logs and Well Drilling Logs
Appendix B	Health and Safety Plan
Appendix C	Field Data Sheets
Appendix D	Chain of Custody Documentation
Appendix E	Laboratory Analytical Data Sheets
Appendix F	BCM Interoffice Correspondence documenting soil sample analytical procedures for samples obtained from
	Borings B-5 and B-6

TABLES

Table 1	Summary of OVA Soil Sample Head Space Analyses
Table 2	Summary of Soil Boring and Stream Bed Elevations
Table 3	Summary of Monitoring Well Elevation Survey
Table 4	Summary of August 1989 Soil Sample Analytical Results
Table 5	Summary of Soil QA/QC Sample Analytical Results
Table 6	Summary of August 29 and 30, 1989 Groundwater Sample Analytical Results
Table 7	Summary of August 29 and 30, 1989 Groundwater QA/QC Sample Analytical Results
Table 8	Summary of September 1989 Groundwater Sample Analytical Results
Table 9	Summary of September 28, 1989 Groundwater QA/QC Sample Analytical Results
Table 10	Summary of Monitoring Well Construction Details and Monitored Aquifer
Table 11	Summary of Groundwater Elevations
Table 12	Vertical Flow Gradient Computations





CONTENTS (Continued)

FIGURES

Figure 1	Site Location Map
Figure 2	Site Plan
Figure 3	Schematic Unconsolidated Aquifer Monitoring Well Construction Diagram
Figure 4	Schematic Rock Aquifer Monitoring Well Construction Diagram
Figure 5	Shallow Groundwater Elevation Contour Map - August 29 and 30, 1989
Figure 6	Shallow Groundwater Elevation Contour Map — September 28, 1989
Figure 7	Isopleth Map of Total VOCs in Groundwater - August 29 and 30, 1989
Figure 8	Isopleth Map of Total VOCs in Groundwater - September 28, 1989



BOM

EXECUTIVE SUMMARY

BCM Engineers Inc. (BCM) implemented Phase I: Additional Investigations of the June 1989 Groundwater Remediation Work Plan from July through September 1989 for the Christiana Metals Corporation (Christiana) at its Bishop Tube Facility in Frazer, Pennsylvania. The investigation included the completion of eight soil borings, analysis of soil installation of seven monitoring wells, and sampling of the monitoring wells for the presence of volatile organic compounds (VOCs). The results of the investigation determined the presence of VOCs in every groundwater monitoring well sample collected except the upgradient well sample. well contained one or more VOCs in concentrations exceeding the primary drinking water maximum contaminant levels (MCLs) established by the U.S. Environmental Protection Agency (EPA). The VOC contaminant plume in groundwater extends to the northeast from the apparent source areas where an aboveground solvent storage tank and a degreaser tank are located. Soil sample analytical results indicated the presence of VOCs in soil apparently caused by upward migration of volatilized VOCs from the contaminated groundwater into the soils.

BCM recommends that additional investigation be implemented to determine the downgradient (offsite) and vertical extent of the plume in the aquifer and to determine proposed groundwater cleanup levels. BCM also recommends proceeding with Phase II: Aquifer Testing to expedite remediation of the highest levels of VOC-contamination detected in onsite groundwater.





1.0 INTRODUCTION

This report presents the results of implementation of Phase I: Additional Investigations of the June 1989 <u>Groundwater Remediation Work Plan</u> for the delineation of volatile organic compound (VOC) contamination in soil and groundwater at Christiana Metals Corporation's Bishop Tube Facility in Frazer, Pennsylvania. The report describes monitoring well installation and soil boring activities, describes sampling activities, discusses the results of the investigation, and provides conclusions and recommendations for additional activities.

1.1 BACKGROUND

In 1981, BCM performed an investigation of the impact of closed waste impoundments on surface water and groundwater at the Bishop Tube plant site in Frazer, Pennsylvania (BCM, 1981) (Figure 1). With the approval of the Pennsylvania Department of Environmental Resources (PADER), four shallow monitoring wells were installed at that time. The results of the study were presented in a 1981 BCM report which documented groundwater fluoride levels (maximum concentration 23.1 milligrams per liter (mg/l) in excess of the drinking water standard of 2.0 mg/l in one well.

In 1987, elevated concentrations of fluoride were detected in shallow groundwater collected at a sump within the plant. Due to an inadvertent connection between the sump and the plant's NPDES-permitted non-contact cooling water discharge, the discharge exceeded the permitted average monthly limit of 10.0 mg/l for fluoride. Bishop Tube has been pumping the sump water to storage for offsite hauling and treatment.

In cooperation with PADER, the July 1987 Work Plan (BCM, 1987) was developed to install additional monitoring wells, collect soil samples in the vicinity of the abandoned waste impoundments, and collect and analyze water samples from the monitoring wells and the adjacent stream. The purpose of the investigation was to update the 1981 study and extend the effort to include other possible groundwater contaminants, such as the degreasing agents used at the plant. PADER's approval of the Work Plan was obtained prior to commencing the project.

In May 1988, BCM presented a report entitled <u>Groundwater Quality Investigation</u> to Bishop Tube (BCM, 1988). The work described in the May 1988 report was conducted in accordance with BCM's PADER-approved, July 1987 Work Plan. The investigation included installing and sampling 5 groundwater monitoring wells, MW-5, MW-6, MW-7, MW-8, and MW-9, at the locations shown in Figure 2, to complement the four existing wells at the site. Five soil borings were drilled and samples were retained for laboratory analysis, and five stream samples were collected and analyzed. The soil boring locations and the stream sampling locations are also shown on Figure 2.





The May 1988 report concluded that Bishop Tube was the apparent source of trichloroethene (TCE) and 1,1,1-trichloroethane (TCA) contamination in groundwater. Data evaluation revealed areas with some metals contamination. The metals contamination in soils appears to be associated with plant operations at the former infiltration basins on the plant site.

Christiana Metals Corporation (Christiana), the former parent company of Bishop Tube, authorized BCM to continue with the next phase of this project by preparing a work plan to delineate the extent of TCE and TCA-bearing groundwater and to develop mitigation measures. The draft Work Plan was prepared by BCM and submitted to PADER during a meeting between representatives of PADER, BCM, and Christiana on July 26, 1988. During this meeting, PADER requested that Bishop Tube conduct quarterly monitoring in the vicinity of the east end of the plant where the cooling water discharges to the stream. This monitoring was requested to document levels of fluoride in groundwater which were anticipated to decrease with time as a result of improvements made in the company's pickle liquor handling practices, the presumed source of the fluoride.

Prior to submission of a Revised Work Plan addressing the PADER requests concerning quarterly monitoring, BCM conducted a soil vapor survey (SVS) in October 1988 along the north side of the facility as proposed in the July 1988 Draft Work Plan. The results of the SVS indicated the presence of low levels of soil contamination (TCE, PCE, and trans-1-2- dichloroethene) within areas of limited lateral extent adjacent to the aboveground Solvent Storage tank, loading area, and concrete storage pad.

BCM's revised Draft Groundwater Remediation Work Plan, dated May 31, 1989, was submitted to Christiana for review and comment. The final Groundwater Remediation Work Plan (Work Plan) was submitted to PADER in June 1989 (BCM, 1989). The final Work Plan, proposed the installation of seven additional groundwater monitoring wells (five shallow wells and two deep wells) numbered MW-10 through MW-16. Also proposed were five soil borings along the north side of the facility in areas identified during the SVS as containing low levels of VOC contamination. During implementation of the Work Plan, three additional soil borings were added to the work scope and were drilled adjacent to the degreaser tank located inside the plant. All soil borings and well locations are shown on Figure 2. The Work Plan also proposed the quarterly groundwater monitoring to be conducted at the east end of the plant and in the vicinity of the NPDES-permitted cooling water discharge.

1.2 OBJECTIVES

The primary objective of this study was to characterize VOC contamination in groundwater and provide recommendations for additional investigations and/or remedial activities. Specific objectives of the study were as follows:





- Determination of potential source area(s) of VOC contamination in the groundwater
- Document shallow and bedrock aquifer water qualities
- Document groundwater flow directions
- Document soil quality in potential source areas
- Implement a quarterly groundwater monitoring program at the east end of the plant and in the NPDES-permitted cooling water discharge area and present the results of the first quarterly sampling results.





2.0 GEOLOGIC SETTING

2.1 GEOLOGY/HYDROGEOLOGY

The Bishop Tube site is located close to the northern base of South Valley Hills. There are two formations in the area, the Wissahickon Formation, a muscovite schist with minor quartz and feldspar and the Conestoga Formation, a crystalline limestone. The Pennsylvania Geological Survey (BERG, 1981) identifies the contact between the Wissahickon and Conestoga Formations to be on the south side of the plant.

The Wissahickon Formation is a medium-to-coarse-grained, banded rock, which is characterized by large amounts of mica and considerable amounts of feldspar. The primary porosity of the rock itself is relatively low. However, abundant secondary porosity structures (joints) within the rock provide openings for the storage and circulation of water. Generally, the size and frequency of joint structures decrease with depth, which in turn, reduce the water-yielding capacity of the formation. The planes of schistosity within the Wissahickon Formation may contain water, but they are generally subcapillary in size and do not yield it freely.

Competent rock belonging to the Wissahickon Formation was encountered in MW-1 on the south side of the plant. A thin and highly weathered zone of the Wissahickon Formation is present beneath most of the northern portion of the site immediately overlying the Conestoga Formation. The Wissahickon Formation encountered on the north side of the plant appears to be colluvium which has migrated downslope from the Wissahickon Formation outcrop on the south side of the plant. The colluvium is thickest on the eastern side of the plant in the vicinity of the stream.

The Conestoga Formation, a dolomitic and shaley limestone, is part of the limestone group that supplies the largest springs in southeastern Pennsylvania. The Conestoga Formation has low primary porosity and, therefore, groundwater migration is mainly through secondary porosity which results from the development of dissolution channels and fractures in the rock. Wells drilled in this rock have yields ranging from less than one gallon per minute (gpm) to 300 gpm (HALL, 1973), depending on the number and size of solution channels or fractures intersected by the well.

The monitoring wells and borings installed at the site indicate that approximately 10 to 20 feet of overburden is present throughout much of the site. Bishop Tube personnel reported that the southwest corner of the lower portion of the plant is set into the limestone and blasting of the rock was required to construct the plant foundation in this area.





The fill and underlying weathered schist are thickest at the northeast corner of the plant in the vicinity of MW-9. The varying amount of overburden soil and fill is probably due to the site's location on a moderately steep slope and the necessity for cut and fill grading during construction of the plant.

A zone of weathered rock, commonly called saprolite exists on top of bedrock throughout much of the area. The saprolite has a lower permeability than the overlying material as evidenced by the presence of perched water at the overburden/saprolite interface. The yields of shallow monitoring wells completed in the perched water zone are typically 0.5 to 1 gpm while wells completed in fractured bedrock below the saprolite generally yield more than 15 gpm.

2.2 SOILS

Soils in the vicinity of the Bishop Tube site are categorized as belonging to the Manor Loam and Conestoga Silt Loam soil units (SCS, 1963).

The Manor Loam is a very fine sandy loam soil and is characteristically found above the Hissahickon Formation. The Manor Loam is a well-drained soil that is moderately permeable and has a moderately low moisture capacity. The Manor Loam is easily eroded from slopes, which explains why it is mainly found on level to gently sloping areas.

The Conestoga Silt Loam covers most of the area immediately north of the plant. This soil unit consists of a well-drained silt loam surface soil and a fine, sandy, clay subsoil. It is moderate in available moisture capacity and has a moderately rapid permeability.





3.0 METHODS OF INVESTIGATION

3.1 TEST BORINGS AND SOIL SAMPLING

Eight soil test borings were drilled at Bishop Tube from August 1 through 18, 1989. Five of the soil borings were installed along the north side of the plant, and three of the borings were installed within the plant in the vicinity of the finished product degreaser tank (Figure 2).

Soil borings along the north side of the plant were drilled with 4.25-inch inside diameter (ID), hollow stem augers. Soil test borings installed inside the plant were installed with 3.25-inch ID hollow stem augers. During test boring drilling, soil samples were collected with 2-inch outside diameter (OD), high carbon steel, split barrel (split-spoon) samplers. A lithologic description of the soil contained in each splitbarrel was recorded by a geologist. Test boring logs providing soil classification, depth to water, boring dimensions, drilling equipment, backfilling methods, and other data are provided in Appendix A.

Representative samples from each split-barrel were placed in glass jars and sealed for the purpose of conducting head space analysis measurements of the relative concentration of VOCs in each sample jar air space. This test provided qualitative information on the relative levels of VOCs in the sampled soil. Following a 10- to 15-minute waiting period to allow any VOCs present in the soil to volatilize into the headspace between the soil sample and the jar lid, each jar was opened and an organic vapor detector (OVA) flame ionization detector probe was inserted into the sample jar head space to remove and analyze a sample of the accumulated vapor. The results of the head space analyses were recorded in the field logbook and are summarized in Table 1.

Selected split-barrel soil samples from each test boring were collected for laboratory analyses. Soil samples were removed from the split-barrel by the onsite geologist using a properly decontaminated stainless steel hand trowel and placed in laboratory cleaned and properly labelled sample jars. All field duplicate samples were composited in properly decontaminated stainless steel mixing bowls. Aliquots of soil for VOC analyses were not composited. Aliquots of soil for VOC analyses were removed from the split-barrel and placed in the proper sample container immediately upon opening the split-barrel soil sampler. All soil samples and field quality assurance/quality control (QA/QC) samples were collected, handled, stored, and transported as specified in the PADER- approved QA/QC Plan and Reporting Deliverables (QA/QC Plan) document contained in Appendix B of the June 1989 Groundwater Remediation Work Plan.





All sampling equipment was decontaminated as specified in the QA/QC Plan. All samples were placed in a chilled environment and transported by the sampler to the BCM Laboratory in Norristown, Pennsylvania.

All onsite work was conducted in accordance with BCM's site-specific Health and Safety Plan, contained in Appendix B.

All soil borings were advanced to the surface of bedrock or auger refusal, whichever was encountered first. Upon encountering one of these conditions, the augers were removed from the borehole and, if the boring was not to be used as a monitoring well location, a 90 percent neat cement/10 percent powdered bentonite grout was pressure tremied from the bottom of the borehole to ground surface. All soil cuttings were then placed in sealed 55-gallon drums for subsequent disposal.

Ground surface elevations and horizontal locations of all boring locations were surveyed by a Pennsylvania-licensed surveyor, and are presented in Table 2. In addition, the vertical elevations of the three stream sampling locations sampled as part of earlier investigation activities were also surveyed and are also presented in Table 2.

3.2 MONITORING WELL INSTALLATION

Seven groundwater monitoring wells were installed on or in the vicinity of the Bishop Tube site from August 2 through 8, 1989. A total of 16 groundwater monitoring wells are now incorporated into the groundwater monitoring well network associated with the hydrogeological investigation being conducted at the Bishop Tube site. Of the seven new monitoring wells installed as part of this investigation, four were installed to monitor the shallow unconsolidated aquifer present in the weathered shist and soil and three were installed to monitor the deeper limestone rock aquifer. Four of the monitoring wells were incorporated into two well clusters, located across the Consolidated Railroad (Conrail) railroad tracks to the north of the site. Each of the well clusters consists of one deep well completed in the Conestoga aquifer and one shallow monitoring well completed immediately above the contact between the overlying unconsolidated soil aquifer and the underlying limestone rock aquifer.

Each of the deep rock aquifer monitoring wells was constructed inside an 6-inch boring drilled using air percussion drilling techniques. The shallow monitoring wells were installed inside 6.25-inch borings drilled with hollow stem augers. Well drilling logs for each monitoring well are presented in Appendix A. Schematic as-built monitoring well diagrams are presented in Figures 3 and 4 for the shallow and deep monitoring wells, respectively.



Generally, each monitoring well was constructed with approximately 10 feet of 4-inch ID, threaded flush joint, 20-slot (0.020 inch), Schedule 40 PVC screen, and 4-inch ID, threaded flush joint, Schedule 40 PVC casing (riser). After inserting the screen and casing, a sand pack of No. 1 Jessie Morie silica sand was installed in the annular space from the bottom of the borehole to approximately two feet above the screen. An approximately 2-foot thick bentonite pellet seal was installed immediately above the sand pack. The bentonite seal was moistened with water if it was above the static water level and allowed to sit undisturbed for approximately 10 minutes to allow the bentonite to expand and seal the borehole.

Following installation of the bentonite seal, a grout consisting of 90-percent neat cement/10-percent bentonite was pressure grouted via a tremie from the top of the bentonite seal to the ground surface. A locking, protective steel casing was installed from approximately 3 feet below ground surface to approximately 2 feet above ground surface, and concrete collars were installed around each protective casing. At selected wells, vehicle access requirements necessitated installation of flush-mounted protective steel casings with locking caps.

The rock monitoring wells MW-13 and MW-15 were constructed using a double casing technique. A 10-inch diameter borehole was drilled through overburden and into competent rock. A 6-inch ID steel casing was installed in the borehole and the annulus around the casing was tremie grouted with a cement/bentonite. A 6-inch diameter borehole was drilled through the steel casing to the desired well completion depth in rock.

Following the installation of all the monitoring wells, each well was developed for approximately 1 hour with either a centrifugal or submersible pump. Well development water was placed in sealed 55-gallon drums for subsequent disposal by Christiana. All downhole well development equipment was properly decontaminated prior to its insertion into each well.

All soil and rock cuttings generated during the drilling of each well were placed in sealed 55-gallon drums for subsequent disposal by Christiana.

All monitoring wells were surveyed by a Pennsylvania-licensed surveyor. The horizontal location of each well was surveyed to the nearest 0.01 foot and the elevations of ground surfaces, inner PVC casings, and outer steel casings, were surveyed to the nearest 0.01 foot above mean sea level. Table 3 presents a summary of the monitoring well elevations.





3.3 GROUNDWATER SAMPLING

As specified in the Work Plan, all new groundwater monitoring wells (MW-10 through MW-16) and groundwater monitoring wells MW-2 and MW-3 were sampled twice. In addition, previously existing groundwater monitoring wells MW-1 and MW-4 through MW-9 were sampled once during the first round of groundwater sampling to initiate the PADER-required quarterly groundwater monitoring program in the pickle liquor handling area. The first round of groundwater sampling was conducted on August 29 and 30, 1989. The second round of groundwater sampling was conducted on September 28, 1989.

Prior to collecting groundwater samples, total well depth and depths to the top of the water columns were measured and recorded, and the volume of water in each well was calculated and recorded. All wells, except MW-13 and MW-15, were purged of a minimum of approximately three well volumes prior to groundwater sampling with either a peristaltic pump or PVC bailer. Approximately two well volumes of groundwater were purged from wells MW-13 and MW-15 prior to sample collection.

During the pumping of each well, the pH, specific conductance, and temperature of the groundwater were measured. Field data sheets are provided in Appendix C. All purge water was placed in sealed 55-gallon drums for subsequent disposal by Christiana. All downhole purging equipment was decontaminated in accordance with the QA/QC Plan contained in Appendix B of the Work Plan.

Groundwater sampling was conducted using laboratory cleaned, dedicated, 2-inch outside diameter (OD) Teflon bailers. Groundwater samples were collected, handled, stored, and transported in accordance with QA/QC protocols contained in Appendix B of the Work Plan. All Chain-of-Custody documentation is provided in Appendix D of this report. Quality Control samples, trip blanks, field blanks, and duplicates were collected and submitted for analyses according to the protocols outlined in the QA/QC document referenced above.

All groundwater samples collected during both rounds of groundwater sampling were submitted to the BCM Laboratory in Norristown, Pennsylvania, for analysis.





4.0 RESULTS OF INVESTIGATION

4.1 SOIL SAMPLE ANALYTICAL RESULTS

A total of 24 discrete soil samples were collected during the period from August 1 through 18, 1989. In addition, two duplicate soil samples, four field blank samples, and three trip blank samples were collected and submitted for laboratory analyses. All samples were analyzed for purgeable halocarbon volatile organic compounds (VOCs) by gas chromatography (GC). Laboratory analytical results for all compounds detected at or above their respective analytical method detection limits are summarized in Table 4. All quality control trip blank and field blank analytical results are summarized in Table 5. Laboratory analytical data sheets are contained in Appendix E.

VOCs detected in soil samples collected at Bishop Tube included the following:

- Bromodichloromethane
- Chloroform
- 1,1-Dichloroethane
- 1,2-Dichloroethane
- trans-1,2-Dichloroethene
- Tetrachloroethene (PCE)
- 1,1,1-Trichloroethane (TCA)
- Trichloroethene (TCE)

Methylene chloride, detected in many of the soil samples, was also detected in field blank and trip blank samples. Methylene chloride is a common laboratory contaminant and does not appear to be attributable to onsite soil conditions. Total VOC concentrations detected in the soil samples ranged from below the method detection limit in samples MW-10A (1.5) and MW-12 (1.5) to a high of greater than 85.5 milligrams per kilogram (mg/kg) in soil sample B-5 (3.5).

It should be noted that the VOC levels in the six samples from borings B-5 and B-6 were unable to be quantified by the laboratory and were reported at levels greater than the maximum instrument detection limit for each of the analyses. Reanalysis of the samples was attempted; however, the results of the reanalysis were anomalously low, suggesting that most of the VOC contaminants in the sample had volatilized out of the soil sample prior to the reanalysis. A description of the procedures utilized by the laboratory to analyze these samples is provided in a BCM interoffice correspondence contained in Appendix F.





4.2 GROUNDWATER SAMPLE ANALYTICAL RESULTS

The groundwater sampling program conducted at Bishop Tube consisted of two separate rounds of monitoring well sampling. The first round of groundwater sampling was conducted on August 29 and 30, 1989, and included collecting samples from monitoring wells MW-1 through MW-16. The second round of groundwater sampling was conducted on September 28, 1989, and included obtaining samples from monitoring wells MW-2 and MW-3 and MW-10 through MW-16.

All groundwater samples obtained in the first round in August were analyzed for pH and specific conductance. Groundwater samples collected from wells MW-1 through MW-9 were also analyzed for fluoride, nitrate, chromium, copper, and nickel to satisfy the quarterly groundwater monitoring requirements in the NPDES-permitted cooling water discharge area at the east end of the plant. All groundwater samples and QA/QC samples were analyzed for VOCs. Laboratory analytical results for all compounds detected at or above their respective analytical method detection limits are presented in the following tables: August 29 and 30 groundwater samples in Table 6, August 29 and 30 QA/QC samples in Table 7, September 28 groundwater samples in Table 8, and September 28 QA/QC samples in Table 9.

Where applicable, the Maximum Contaminant Levels (MCLs) established by the U.S. Environmental Protection Agency (EPA) for the respective contaminants in drinking water are listed on the tables. All laboratory analytical data sheets are presented in Appendix E.

4.2.1 August 29 and 30. 1989. Sample Analytical Results

VOCs detected in the groundwater samples collected on August 29 and 30 included the following:

- Chloroethane
- 1.1 Dichloroethane
- 1.2 Dichloroethane
- 1,1 Dichloroethene
- Methylene Chloride
- Tetrachloroethene (PCE)
- trans-1,2-Dichloroethene
- 1,1,1-Trichloroethane (TCA)
- Trichloroethene (TCE)
- Vinyl Chloride

Total VOC concentrations ranged from not detected above the method detection limit of 1 microgram per liter (ug/l) in background monitoring well MW-1 to a high of 202,607 ug/l in well MW-3. Each well in which VOC compounds were detected contained one or more VOC compounds at levels above the MCLs established for the respective VOC in drinking water. No VOCs were detected in the QA/QC blanks.



Fluoride concentrations ranged from less than 0.1 mg/l in MW-l to a high of 14.1 mg/l in MW-4. Fluoride was above its MCL of 4.0 mg/l in moni-toring wells MW-4, MW-5, MW-6, and MW-7.

Nitrate concentrations ranged from a low of 0.099 mg/l in MW-5 to a high of 7.13 mg/l in MW-4. Nitrate was not detected above its MCL of 10 mg/l in any of the wells.

The low (more acidic) pH of 5.83 standard units (S.U.) was detected in sample MW-7 and the high (more basic) pH of 7.34 S.U. was detected in sample MW-13. A secondary MCL has been established for pH and ranges from 6.5-8.5. pH was below (more acidic) the secondary MCL in monitoring wells MW-1, MW-4, and MW-7.

Specific conductance ranged from 95 micromhos (umhos) in MW-1 to 4,600 umhos in MW-5. No MCL has been established for specific conductance in drinking water.

Chromium levels ranged from below the method detection limit of 0.01 mg/l to 0.220 mg/l in sample MW-7. The MCL for chromium in drinking water is 0.05 mg/l and was exceeded in monitoring well MW-7.

Copper levels ranged from below the method detection limits of 0.02 mg/l to a high of 0.035 mg/l in sample MW-1. Copper has a secondary MCL of 1.0 mg/l which was not exceeded in any of the samples.

Nickel levels ranged from below the method detection limits of 0.04~mg/l to a high of 0.269~mg/l in MN-4. An MCL has not been established for nickel in drinking water.

4.2.2 <u>September 28, 1989</u>, <u>Sample Analytical Results</u>

The VOCs detected in the groundwater samples collected on September 28 were the same as those detected in the August 29 and 30 samples with the exceptions that 1,2-dichloroethane was not detected in the September samples, and chloroform, undetected in the August samples, was detected in the September analyses. Total VOC concentrations ranged from a low of 348 ug/l in sample MW-10A to a high of 684,890 ug/l in sample MW-3. Selected VOCs were detected in all the samples at levels above their respective MCLs. TCE and methylene chloride were detected in all field QA/QC samples.

4.3 HYDROGEOLOGIC ANALYSIS

The results of the groundwater investigation indicate that two aquifers are present at the site and have both been impacted by VOC contamination. The shallow aquifer occurs in the unconsolidated soil and saprolite unit and a deeper aquifer occurs in the Conestoga Limestone. A summary of the monitoring well construction details and the monitored aquifers is presented in Table 10.





Water table elevation measurements were obtained prior to each ground-water sampling event. A summary of the measured groundwater elevations is presented in Table 11. Groundwater flow in both aquifers is to the north-northeast and is shown in Figures 5 and 6. The lateral gradients are approximately 0.15 ft/ft in the area of the highest levels of groundwater contamination

The shallow and deep aquifers are evidenced by the difference in elevation of the water table observed at well clusters at the site. Wells monitoring shallow groundwater at each cluster generally have higher water table elevations than wells monitoring groundwater occurrence in the bedrock aquifer at each cluster. The elevation difference between the two aquifers indicates that the aquifers are not in equilibrium.

The vertical hydraulic gradients were determined at well cluster locations where wells exist that monitor the two different aquifers. An analysis of vertical gradients is summarized in Table 12. The results of this determination indicate that a downward vertical gradient exists at three of the four well cluster locations. Well cluster MW-15/MW-16 indicated an upward vertical gradient.

The upward vertical gradient at well cluster MW-15/MW-16 may be resulting from the void encountered in MW-15 during drilling. The void maybe connected to areas hydraulically upgradient of the well and the water levels being measured in the well may be representative of hydraulic conditions in the upgradient areas.

Well cluster MM-13/MM-14, located hydraulically downgradient of the site, and approximately 250 feet west of well cluster MM-15/MM-16, had a downward hydraulic gradient. The discrepancy between the vertical hydraulic gradients prevents a determination of groundwater gradients in the offsite area. This discrepancy also emphasizes the heterogeneities present in the fractured and solution channel-bearing limestone aquifer.





5.0 DISCUSSION OF RESULTS

The results of the soil and groundwater investigation indicate that elevated levels of VOCs are present in onsite soils and in onsite and off-site groundwater.

5.1 SOIL SAMPLING RESULTS

The soil sample analytical results indicate that VOC contamination is present in nearly all soils at the site. Generally, the detected levels of VOC contamination increased with increasing depth, suggesting that VOCs may have migrated upward into the soils after volatilizing from VOC contaminated groundwater.

The highest levels of VOCs detected in soils by headspace and laboratory analyses were in Borings B-5, B-6, B-10, B-11, and B-12. Borings B-5 and B-6 were drilled adjacent to the aboveground solvent storage tank. The locations of these soil borings were selected based on the results of the soil vapor survey (SVS) that was conducted in this area in October 1988. The soil sample analyses support the findings of the SVS which identified the tank as a potential source for the VOC contamination in soil and groundwater.

Borings B-10, B-11, and B-12 were drilled in the vicinity of the degreaser inside the building. Samples B-11 (6.5) and B-12 (4.5) contained the highest levels of total VOCs detected in soil in this study (3,367) and 157 mg/kg, respectively). These soil sample analytical results indicate that the degreaser tank is a likely source of VOC contamination in groundwater and soil at this site.

5.2 **GROUNDWATER SAMPLING RESULTS**

The groundwater sample analytical results indicate the presence of VOCs in groundwater in all wells except the background well (MW-1). Specific VOCs were detected in all wells at levels above their respective MCLs. The downgradient extent and the vertical extent of the contaminant plume have not been determined. The VOC contaminant plume appears to trend to the northeast and originates from the aboveground solvent storage tank and degreaser tank areas. The VOC contaminant plume is shown in Figures 7 and 8 for the August 29 and 30 and the September 28 sampling events, respectively.

The VOC plume appears to be oriented slightly to the east of the ground-water flow direction which is to the north northeast. The difference between groundwater flow direction and contaminant distribution may be the result of heterogeneities in the Conestoga



Limestone aquifer. The Conestoga Limestone aquifer has numerous dissolution channels and fractures which act as the primary conduits for groundwater flow in the aquifer. The orientation of these conduits in the rock strata will effect the groundwater and contaminant flow direction.

The most prevalent VOCs detected in groundwater were TCE and TCA and their degradation products. TCE was consistently the VOC detected at the highest levels in the well samples followed in concentration by TCA and trans-1,2-dichloroethene. TCE and FCA are both heavier than water and will tend to sink in the aquifer when released as product. Trans-1,2-dichloroethene is slightly lighter than water and will tend to float on water when released as product. TCE, TCA, and trans-1, 2-dichloroethene have relatively low solubilities ranging from approximately 0.1 percent (TCE) to 0.63 percent (trans-1,2-dichloroethene).

The highest levels of VOCs detected in groundwater in both aquifers in both sampling events were at the well cluster MM-2/MW-3 which is located adjacent to the aboveground solvent storage tank. Monitoring well MM-2 monitors the uppermost portion of the Conestoga Limestone aquifer and monitoring well MM-3 monitors the unconsolidated aquifer above it. The results of both sampling rounds indicated that the shallow aquifer contains significantly higher levels of VOCs than the deeper limestone aquifer. Three other well clusters are situated in the vicinity of the plant and are at greater distances from the potential source area. Sample analytical results from well clusters MM-15/MM-16 and MM-8/MM-9 determined that the deep wells monitoring the rock aquifer have higher levels of VOCs than the shallow wells monitoring the unconsolidated aquifer. These results are consistent with the concept that the contaminants have migrated into the deeper rock aquifer and impacted the downgradient well clusters MM-15/MM-16 and MM-8/MM-9.

The well cluster MW-13/MW-14 showed inconsistent results between the two sampling rounds. The deep well (MW-13) monitoring the rock aquifer contained higher levels of total VOCs than the shallow well (MW-14) monitoring the unconsolidated aquifer in the August sampling. Lower levels of total VOCs were detected in the deep well than in the shallow well in the September sampling. These results suggest that the samples may have been mislabeled. The VOC levels in these wells will be confirmed by samp-ling and analyses to be conducted in subsequent phases of the investi-gation.

The results of the quarterly monitoring of groundwater wells in the vicinity of the NPDES-permitted cooling water discharge area detected fluoride and chromium at levels above their respective MCLs in selected wells. Continued quarterly monitoring of these wells will determine if the levels of these contaminants will decrease with time as expected by the repair of the sump in the shop, the suspected source area for these contaminants in groundwater.





The secondary MCL for pH was exceeded in MW-1, MW-4, and MW-7. MW-1 is situated hydraulically upgradient of the site and monitors the rock aquifer. MW-1 contained the lowest pH measurement which indicates that groundwater in the Wissahickon Formation may be naturally more acidic than groundwater in the Conestoga Formation.

5.3 HYDROGEOLOGY

The information obtained from the hydrogeologic investigation indicates that contaminated groundwater is apparently migrating from the above-ground solvent storage tank and degreaser tank areas towards the north-east. The analysis of vertical hydraulic gradients indicates that a downward vertical hydraulic gradient exists in the vicinity of the source areas at the plant. This analysis concurs with the groundwater analytical results from the offsite well clusters which document the presence of higher levels of VOCs in the Conestoga Limestone aquifer than in the unconsolidated aquifer. This analysis further indicates that contamination appears to be entering the limestone aquifer in the vicinity of the source areas and is migrating to the northeast through the rock aquifer. Lower levels of VOC contamination exist in the shallow aquifer and are migrating offsite to the northeast.

The release of TCE or TCA solvent product into the aquifer may have resulted in the occurrence of a discrete body of solvent product in the aquifer. These solvents are more dense than water and have relatively low solubilities, which will cause the body of solvent to migrate downward in the aquifer as it solubilizes. The primary control over flow in the limestone aquifer is the occurrence of solution channels and fractures; therefore, the rate of migration of the solvent product (dense non-aqueous phase liquid or DNAPL) or the dissolved solvent in groundwater will be primarily controlled by the occurrence and interconnection of fractures and solution channels in the vicinity of the source areas. No estimates on the rate of migration of the contaminant plume can be developed without conducting aquifer testing.





6.0 CONCLUSIONS

The results of the Phase I investigation determined that VOCs are present in groundwater at levels above their respective MCLs for drinking water. A VOC contaminant plume exists in the groundwater extending to the northeast from the plant. The apparent sources of the VOC contaminant plume are the aboveground solvent storage tank and the degreaser tank. VOC contamination exists in both the shallow unconsolidated soil aquifer and the deeper (Conestoga Formation) aquifer. The depth and downgradient extent of the contamination in the aquifer can not be determined without additional aquifer characterization.

Soil sample analytical results indicate the presence of VOCs in soil in the vicinity of the aboveground solvent storage tank and the degreaser. In general, the highest levels of soil contamination are found at depth near the groundwater surface indicating that the volatilized VOCs may have migrated upward into the soil from contaminated groundwater. The highest levels of VOC contamination in soils was observed in borings drilled adjacent to the aboveground solvent storage tank and degreaser tank.

Fluoride and chromium were detected above their respective MCLs in groundwater in the vicinity of the NPDES-permitted cooling water discharge location. Continued quarterly monitoring of groundwater quality in this area will enable an evaluation of the effectiveness of repairing the sump, the suspected source of the fluoride contamination in groundwater.





7.0 RECOMMENDATIONS

BCM recommends that additional investigations be conducted and that Phase II - Aquifer Testing be implemented to enable Christiana to proceed with remediation of onsite VOC contamination in groundwater. The additional investigations should include the following:

- Conducting a tracer test on the solvent handling areas to characterize the integrity of the solvent handling apparatus (i.e. storage tank, piping, and degreaser tank)
- Conducting a well records search in the vicinity of the site to identify potential groundwater users and downgradient water quality
- Implementing a drilling and sampling investigation to delineate downgradient (offsite) and vertical extent of VOC contamination in the aguifer.
- Incorporating the results of the above tasks into an investigation of possible risk-based cleanup levels applicable to this site

BCM recommends that Christiana proceed with Phase II: Aquifer Testing of the June 1989 <u>Groundwater Remediation Work Plan</u> to expedite remediation of the highest levels of VOC contamination detected in onsite groundwater concurrent with the additional investigations defined above.





8.0 REFERENCES

- BCM Engineers Inc., 1989. Christiana Metals Corporation, Bishop Tube Facility, Frazer, Pennsylvania, Groundwater Remediation Work Plan. June.
- --- 1988. Bishop Tube Company, Frazer, Pennsylvania, Groundwater Quality Investigation. May.
- --- 1987. Bishop Tube Company, Frazer, Pennsylvania, Proposed Work Plan for a Groundwater Quality Investigation. July.
- --- 1981. Bishop Tube Company, Frazer, Pennsylvania, Hydrogeologic Investigation. October.
- Berg, Thomas M. and Christine M. Dodge, 1981. Atlas of Preliminary
 Geologic Quadrangle Maps of Pennsylvania. Pennsylvania Geological
 Survey, Harrisburg, Pennsylvania.
- Hall, George M., 1973. <u>Groundwater in Southeastern Pennsylvania</u>. Pennsylvania Geological Survey, Harrisburg, Pennsylvania. 255pp.
- Soil Conservation Service, 1963. Soil Survey Chester and Delaware Counties. Pennsylvania. United States Department of Agriculture, Washington, D.C. 124pp.





TABLES





TABLE 1 SUMMARY OF OVA SOIL SAMPLE HEAD SPACE ANALYSES*

CHRISTIANA METALS CORPORATION BISHOP TUBE FACILITY FRAZER, PENNSYLVANIA

Samp1	le I.D.**	Reading (PPM)***
MW-10	(0-2)	140
	(2-4)	30
·B-5	(0-2)	90
	(2-4)	>1000
	(4–6)	>1000
	(6-8)	300
B-6	(0-2)	600
	(2-4)	
	(4–6)	120
B-7	(0-2)	1
	(4–6)	8
	(10-12)	60
B-8	(0-2)	NIR
and	(4-6)	NIR
MW 1 1	(8–10)	2
	(12-14)	NIR
	(14-16)	NIR
(1	6-17.5)	NIR
MW-12	(0-2)	NIR
	(2-4)	NIR
	(4-6)	NIR
	(6-8)	NIR
	(8-10)	NIR
	(12–14)	NIR
	(14–16)	NIR
	(16–18)	NIR
	(18-20)	NIR





TABLE 1 (Continued)

Samı	ole I.D.**	Reading (PPM)***
B-9	(0-2)	2
	(6-8)	
	(10-12)	300
	(12-14) (20-22)	20
	(20-22)	2
MW-14	(5-7)	NIR
	(10-12)	NİR
B-10	(0-2)	10
	(3-5)	8 6
	(5–7)	6
	(9–11)	NIR
	(11–13)	NIR
	(13-15)	NIR
B-11	(0-2)	250
	(3–5)	>1000
	(5-7)	>1000
	(9-11)	160
	(13-15)	>1000
	(15–17)	>1000
B-12	(3-5)	>1000
	(5-7)	>1000
	(7-9)	45

Notes:

Summarized from Field Log Book Boring Number (depth of sample in feet) All readings obtained using portable flame ionization vapor analyzer No Instrument Response

NIR





TABLE 2 SUMMARY OF SOIL BORING AND STREAM BED ELEVATIONS

CHRISTIANA METALS CORPORATION BISHOP TUBE FACILITY FRAZER, PENNSYLVANIA

oring/Stream Location	Elevation (in feet, referenced to NGVD 19							
D E	384.48							
B-5 8-6	384.35							
B-7	384.05							
B-9	383.07							
Stream 1	358.50							
Stream 2	368.90							
Stream 3	378.20							





TABLE 3
SUMMARY OF MONITORING WELL ELEVATION SURVEY *

CHRISTIANA METALS CORPORATION BISHOP TUBE FACILITY FRAZER, PENNSYLVANIA

		Elevation (fe	et)a		
Well No.	Ground	Top Inner Casing	Top Outer Casing		
-					
MW-1	423.86	424.21	424.66		
MW-2	384.00	384.37	384.72		
MW-3	383.94	384.66	385.04		
MW4	386.74	387.08	387.52		
MW-5	387.24	387 89	388.45		
MW-6	387.48	388.48	388.64		
MW-7	396.96	398.69	399.20		
MW-8	388.09	384.14	384.31		
MW-9	382.81	ИМр	384.10		
MW-10	384.56	383.87	384.54		
MW-11	384.00	383.42	384.03		
MW-12	383.15	382.46	383.15		
MW-13	373.45	374.83	375.21		
MW-14	373.18	374.30	375.08		
MW-15	367.94	369.68	370.07		
MW-16	367.91	369.80	370.20		

Notes:

NM - Not measured.

a. Elevations are references to the NGVD 1929.

b. MW-9 was not constructed with an inner casing. This well is an open rock well. Depth to water was measured from the top of the steel casing.

* Well Elevations Surveyed by James M. Stewart, Inc.

TABLE 4
SUMMARY OF AUGUST 1989 SOIL SAMPLE ANALYTICAL RESULTS

CHRISTIANA METALS CORPORATION BISHOP TUBE FACILITY FRAZER, PENNSYLVANIA

Sampling Location: Sample Depth: Sampling Date: BCM Sample Number:	Units	MW-10A ^a 1.5 08/01/89 923863	B-5 ^a 1.5 08/01/89 923864	B-5 ^a 3.5 08/01/89 923865	8-5 ^a 4.5 08/01/89 923866	8-5 ^a 6.5 08/01/89 923867	B-6 ^a 1.5 08/01/89 923868	B-6 ^a 5.5 08/01/89 923869
Volatile Organic Compounds (VOCs)								
Bromodichloromethane	mg/kg	<0.0114	<0.0141	>4.0	>0.1	>0.5	<0.115	<0.118
1,1-Dichloroethane	mg/kg	<0.0114	<0.0141	0.1<	>1.0	>1.0	>3.0	>0.7
1,2—Dichloroethane	mg/kg	<0.0114	<0.0141	<0.116	>0.116	<0.116	<0.115	<0.118
1,1-Dichloroethene	mg/kg	<0.0114	>0.2	>20	>20	>3.0	>10	>10
Methylene Chloride	mg/kg	<0.0114	<0.0141	>0.5 ^b	>1.0 ^b	>0.1 ^b	>0.2 ^b	>0.1 ^b
1,1,1-Trichloroethane	mg/kg	<0.0114	>0.0141	>40	>50	>4.0	>5.0	>5.0
Trichloroethene (TCE)	mg/kg	<0.0114	>2.0	>20	>10	>8.0	>10	>10
Total VOCs	mg/kg	ND	>2.2	>85.5	 >82.2	>16.7	>28.2	>25.8



TABLE 4 (Continued)

Sampling Location: Sample Depth: Sampling Date: BCM Sample Number:	Units	MW-11 1.5 08/02/89 924150	MW-11 9.5 08/02/89 924151	B-7 1.5 08/02/89 924152	8-7 10.5 08/02/89 924153	B-7(Dup) 10.5A 08/02/89 924154	B-7 13.0 08/02/89 924155
Volatile Organic Compounds (VOCs)			 , -		-	•	
Chloroform	mg/kg	<0.0116	<0.0117	<0.0116	<0.0119	<0.0117	0.582
1,1—Dichloroethene	mg/kg	<0.0116	<0.0117	<0.0116	0.0705	0.0420	0.0481
Methylene Chloride	mg/kg	0.0301 ^c	0.0281 ^c	0.0337 ^c	0.0311 ^c	0.0350 ^c	<0.0134
1,1,1—Trichloroethane	mg/kg	<0.0116	<0.0117	<0.0116	<0.0119	<0.0117	0.728
Trichloroethene (TCE)	mg/kg	<0.0116	0.0223	<0.0116	<0.0119	0.219	0.781
Total VOCs		0.0301	0.0504	0.0337	0.1016	0.2960	2.139

TABLE 4 (Continued)

Sampling Location: Sample Depth: Sampling Date: BCM Sample Number:	Units	MW-12 1.5 08/03/89 924156	MW-12 7.5 08/03/89 924157	MW-12 15.0 08/03/89 924158	B-9 1.5 08/03/89 924159	B-9 7.5 08/03/89 924160	B-9(Dup) 7.5A 08/03/89 924161	B-9 10.5 08/03/89 924162
Volatile Organic Compounds (VOCs)								· · ·
Chloroform	mg/kg	<0.0115	<0.0124	0.0237	<0.0118	<0.0117	<0.0115	0.0763
Methylene Chloride	mg/kg	<0.0115	<0.0124	<0.0158	<0.0118	<0.0117	<0.0115	0.0157 ^C
trans-1,2-Dichloroethene	m g/kg	<0.0115	<0.0124	<0.0158	0.0662	0.0653	0.229	0.0182
1,1,1-Trichloroethane	mg/kg	<0.0115	<0.0124	0.117	<0.0118	<0.0117	<0.0115	<0.0121
Trichloroethene (TCE)	mg/kg	<0.0115	0.0136	0.758	0.0225	<0.0117	0.0311	0.0702
								
Total VOCs		ND	0.0136	0.8987	0.0887	0.0653	0.2601	0.1804



TABLE 4 (Continued)

Sampling Location: Sample Depth: Sampling Date: BCM Sample Number:	Units	B-10 1.5 08/18/89 926125	B-10 6.5 08/18/89 926126	B-11 1.5 08/18/89 926127	B-11 6.5 08/18/89 926128	B-12 4.5 08/18/89 926129	8-12 6.5 08/18/89 926130
Volatile Organic Compounds (VOCs)							
1,1-Dichloroethene	mg/kg	<0.0117	<0.0116	<0.0119	39.8	<1.15	<0.0605
Methylene Chloride	mg/kg	<0.0117	<0.0116	<0.0119	1.44	<1.15	0.357
Tetrachloroethene (PCE)	mg/kg	<0.0117	<0.0116	<0.0119	10.2	<1.15	<0.0605
1,1,1-Trichloroethane	mg/kg	<0.0117	<0.0116	<0.0119	36.0	<1.15	<0.0605
Trichloraethene (TCE)	mg/kg	1.03	<u><0.0116</u>	0.0226	<u>3280</u>	<u>157</u>	6.99
Total VOCs		1.03	<0.0116	0.0226	3367	157	7.347

Notes:

ND ≈ None detected.

 Peak areas for these samples were outside of the calibration curve, consequently, a quantitative value could not be determined (see Appendix F).

b. Compound also detected in the field blank dated 08/01/89.

c. Compound also detected in the trip blank dated 08/01/89. This trip blank is associated with the 08/02/89 samples.



TABLE 5
SUMMARY OF SOIL QA/QC SAMPLE ANALYTICAL RESULTS

CHRISTIANA METALS CORPORATION BISHOP TUBE FACILITY FRAZER, PENNSYLVANIA

Sample ID: Sampling Date: BCM Sample Number:	Units	Trip Blank 07/31/89 923870	Field Blank 08/01/89 923871	Trip Blank 08/01/89 924163	Field Blank 08/02/89 924164	Field Blank 08/03/89 924165	Trip Blank 08/17/89 926131	Field Blank 08/17/89 926132
Volatile Organic Compounds (VOCs) ^a								
Methylene chloride	ug/1	<1.0	5.6	2.1	<1.0	<1.0	<1.0	<1.0

Notes:

a. With the exception of methylene chloride, no other VOCs were detected in these samples.



TABLE 6
SUMMARY OF AUGUST 29 AND 30, 1989 GROUNDWATER SAMPLE ANALYTICAL RESULTS

CHRISTIANA METALS CORPORATION BISHOP TUBE FACILITY FRAZER, PENNSYLVANIA

Sampling Location: Sample ID: Sampling Date: SCM Sample Number:	Units	USEPA MCL	MW-1 Unfiltered 08/29/89 927566	MM-1 Filtered 08/29/89 927571	MW-2 Unfiltered 08/30/89 927720	MW-3 Unfiltered 08/30/89 927721	MW-4 Unfiltered 08/29/89 927567	HW-4 Filtered 08/29/89 927572
/olatile Organic Compounds (VOCs)	-							·
I.1-Dichloroethane	ug/1	NL	<1.0	NT	157	14.0	11.2	NT
1,2-Dichloroethane	ug/1	5.0	<1.0	NT	1,050 *	<10.0	<1.0	NT
,1-Dichloroethene	ug/1	7.0	<1.0	NT	611 *	103 *	5.5	NT
lethylene Chloride	ug/1	NL	<1.0	NT	10.9	<10.0	<1.0	NT
etrachloroethene (PCE)	ug/1	NL	<1.0	NT	85.6	124	24.9	NT
rans-1,2-Dichloroethene	ug/1	NL	<1.D	NT	685	236	316	NT
,l,l-Trichloroethane	ug/1	200	<1.0	NT	17,300 *	3,130 *	18.9	NT
richloroethene (TCE)	ug/1	5.0	<1.0	NT	36,100 *	199,000 *	1110 *	NT
inyl Chloride	ug/1	2.0	<1.0	NT	<u><10.0</u>	<u><10.0</u>	<u>42.2</u> *	NT
otal VOCs ^d		NL	ND	NT	56,000	202,607	1,529	NT
norganic and Physical Parameters								
Juoride	mg/l	2.0-4.0ª	<0.1	NT	NT	NT	14.1 *	NT
litrate	mq/l	10.0	0.789	NT	NT	NT	7.13	NT
H-field	Stnd.Units	6.5-8.5 ^b		NT	NT	NT	6.28 *	NT
pecific Conductance	umhos	NL.	95	NT	NT	NT	500	NT
<u>letals</u>								
Chromium	mg/l	0.05	NT	<0.01	NT	NT	NT	0.011
Copper	mg/1	1.05	NT	0.035	NT	NT	NT	0.027
lickel	mg/1	NL	NT	<0.04	NT	NT	NT	0.269



TABLE 6 (Continued)

Sampling Location: Sample ID: Sampling Date: BCH Sample Number:	Ui	nits	USEPA MCL	MW-5 Unfiltered 08/29/89 927568	HM-5 Filtered 08/29/89 927573	MH-6 Unfiltered 08/29/89 927569	MW-6 Filtered 08/29/89 927574	MW-7 Unfiltered 08/29/89 927570	MW-7 Filtered 08/29/89 927575
Volatile Organic Compounds (VOCs)									
Chloroethane 1,1-Dichloroethane 1,1-Dichloroethene Tetrachloroethene (PCE) trans-1,2-Dichloroethene 1,1,1-Trichloroethane Trichloroethene (TCE) Vinyl Chloride Total VOCsd	1	ug/1 ug/1 ug/1 ug/1 ug/1 ug/1 ug/1	NL NL 7.0 NL NL 200 5.0 2.0	3.3 16.6 <1.0 <1.0 18.5 <1.0 <1.0 4.2 *	NT NT NT NT NT NT NT	<1.0 9.9 6.5 <1.0 82.4 70.1 526 * 8.7 *	NT NT NT NT NT NT NT	<1.0 1.3 <1.0 <1.0 <1.0 49.3 2.5 78.9 * <1.0	NT NT NT NT NT NT NT
Inorganic and Physical Parameters Fluoride Nitrate pH-field Specific Conductance	Stnd.	mg/] mg/l	2.0-4.0 ^a 10.0 6.5-8.5 ^b NL	9.56 * 0.099 6.62 4,600	NT NT NT NT	8.02 * 1.67 6.58 710	NT NT NT NT	5.66 * 2.21 5.83 * 250	NT NT NT NT
Metals Chromium Copper Nickel		mg/1 mg/1 mg/1	0.05 1.0 ⁶ NL	NT TH TH	<0.01 0.022 0.090	NT TN TN	0.01 0.021 <0.04	NT NT NT	0.220* <0.02 0.251



TABLE 6 (Continued)

ampling Location: ample ID: ampling Date: CH Sample Number:	Un	its	USEPA MCL	MW-8 Unfiltered 08/29/89 927714	HM-8 Filtered 08/29/89 927717	MW-8A ^C Unfiltered 08/29/89 927715	MW-8A ^C Filtered 08/29/89 927718	MW-9 Unfiltered 08/29/89 927716	MW-9 Filtered 08/29/89 927719
olatile Organic Compounds (VOCs)									
hloroethane	U(q/1	NL	16.6	NT	<1.0	NT	<1.0	NT
, I-Dichloroethane	u	g/1	NL	3.2	NT	2.8	NT	20.6	NT
,1-Dichloroethene	u	ğ/۱	7.0	37.7 *	NT	<1.0	NT	63.3 *	NT
lethylene Chloride	u	g/l	NL	1.6	NT	1.1	NT	2.4	NT
etrachloroethene (PCE)	U	g/1	NL	9.3	NT	9.2	NT	14.9	NT
rans-1,2-Dichloroethene	u _t	g/l	NL	803	NT	798	NT	482	NT
,l,l-Trichloroethane		g/1	200	399 *	NT	395 *	NT	621 *	NT
richloroethene (TCE)		g/)	5.0	2,860 *	NT	2,750 *	NT	4,130 *	NT
/inyl Chloride	U	g/l	2.0	<u>86.8</u> *	NT	<u>60.8</u> *	NT	<u>14.4</u>	NT
otal VOCs ^d	U	g/1	NL	4,217	NT	4,008	NT	5,349	NT
norganic and Physical Parameters									
lugride		g/1	2.0-4.0a	1.11	NT	1.02	NT	2.57	NT
litrate		g/1	10.0.	0.327	NT	0.121	NT	0.106	NT
H-field	Stnd. U		6.5-8.5 ^b	6.91	NT	6.91	NT	6.98	NT
pecific Conductance		mhos	NL	440	NT	440	NT	450	NT
<u>letals</u>									
Chromium	•	ıg/1	0.05	NT	0.012	NT	<0.01	NT	<0.01
Copper		g/i	₹0.0 ₹0.1	NT	<0.02	NT NT	<0.02	NT	(0.01
ickel		g/ g/	NL NL	NT	<0.04	NT	<0.04	NT	<0.04

A

131

TABLE 6 (Continued)

								•		
Sampling Location: Sample ID: Sampling Date: BCM Sample Number:	Units	USEPA HCL	MW-10 Unfiltered 08/30/89 927722	MH-11 Unfiltered 08/30/89 927723	MW-12 Unfiltered 08/30/89 927724	MW-13 Unfiltered 08/30/89 927576	MM-14A Unfiltered 08/29/89 927577	MW-148 ^c Unfiltered 08/29/89 927578	MW-15 Unfiltered 08/29/89 927579	MW-16 Unfiltere 08/29/89 927580
Volatile Organic Compound	ls (VOCs)									
Chloroethane	ug/1	NL	<1.0	<10.0	<10.0	<1.0	<1.0	<1.0	<1.0	18.6
1.1-Dichloroethane	ug/1	NL.	1.4	900	12.8	33.6	8.9	7.3	53.8	419
1,2-Dichloroethane	ug/1	5.0	<1.0	103 *	<10.0	<1.0	<1.0	<1.0	<1.0	41.8 *
1.1-Dichloroethene	ug/1	7.0	<1.0	600 *	<1.0	<10.0	16.6 *	13.2 *	564 *	140 *
Methylene Chloride	ug/1	NL	<1.0	15.0	14.8	<1.0	<1.0	<1.0	1.8	<1.0
Tetrachloroethene (PCE)	ug/1	NL	<1.0	32.1	14.7	23.5	<1.0	<1.0	39.3	7.4
trans-1.2-Dichloroethene		NL	4.6	1.970	85.9	110	12.5	10.6	570	169
1,1,1-Trichloroethane	ug/l	200	84.2	20,700 *	540 *	3,470 *	287 *	323 *	7,800 *	2,340 *
Trichloroethene (TCE)	ug/1	5.0	93.8 *	17,100 *	3,940 *	10,600 *	666 *	751 *	44,400 *	4,580 *
Vinyl Chloride	ug/1	2.0	<u>\$1.0</u>	<u><10.0</u>	<10.0	<u>0.12</u>	<u> </u>	<u><1.0</u>	<u><1.0</u>	<u><1.0</u>
Total VOCs ^d	ug/ì	NL	184	41,420	4,608	14,401	991	1,105	53,429	7,716
<u>Physical Parameters</u>										
pH-field	Stnd.Units		NT	NT	NT	7.34	6.95	6.95	7.13	7.18
Specific Conductance	umhos	NL	NT	NT	NT	380	430	430	610	380

Notes:

USEPA MCL = United States Environmental Protection Agency Maximum Contaminant Level.

ND = None detected.

NL = No USEPA MCL is listed.

NT = Not tested as part of this study.

* = Compound detected above USEPA MCL.

a. The HCL for fluoride ranges from 2 mg/l, the secondary MCL, to 4 mg/l. This range of values depends on the average air temperature of the region.

b. This value is a secondary MCL.

c. Sample is a duplicate of the previous sample.

d. Total VOC values are rounded as appropriate.







TABLE 7

SUMMARY OF AUGUST 29 AND 30, 1989, GROUNDWATER QA/QC SAMPLE ANALYTICAL RESULTS

CHRISTIANA METALS CORPORATION BISHOP TUBE FACILITY FRAZER, PENNSYLVANIA

Sample ID:	Units	Trip Blank	Field Blank	Trip Blank	Field Blank
Sampling Date:		08/29/89	08/29/89	08/30/89	08/30/89
8CM Sample Number:		927581	927582	927725	927726
Volatile Organic Compounds		ND	ND	ND	ND

Notes:

ND = No compounds detected.

TABLE 8
SUMMARY OF SEPTEMBER 28, 1989, GROUNDWATER SAMPLE ANALYTICAL RESULTS

CHRISTIANA METALS CORPORATION BISHOP TUBE FACILITY FRAZER, PENNSYLVANIA

ampling Location: ampling Date: BCM Sample Number:	Units	USEPA HCL	MH-2 09/28/89 930389	MW-3 09/28/89 930390	MW-10A 09/28/89 930391	MM-108 ^a 09/28/89 930392	
/olatile Organic Compounds (VOCs)							,
,1-Dichloroethane	ug/1	NL	157	<1,000	4.3	6.3	
,1-Dichloroethene,	uğ/l	7.0	1,190 *	<1,000	2.6	4.9	
lethylene Chloride ^b	ug/1	NL	152	2,160	2.8	<1.0	
etrachloroethene (PCE)	ug/l	NL	102	<1,000	<1.0	1.0	
rans-1,2-Dichloroethene	ug/1	NL.	623	<1,000	9.9	14.2	
,1,1-Trichloroethane	ug/1	200	16,500 *	2,730 *	84.4	112	
richloroethene (TCE) ^C	ug/1	5.0	48,900 *	680,000 *	244 *	227 *	
inyl Chloride	ug/1	2.0	<100	<u> <1.000</u>	<1.0	1.5	
Total VOCs ^d	ug/1	NL	67,624	684.890	348	367	



TABLE 8 (Continued)

Sampling Location: Sampling Date: BCM Sample Number:	Units	USEPA MCL	MM-11 09/28/89 930393	MW-12 09/28/89 930394	MW-13 09/28/89 930395	MW-14 09/28/89 930396	MW-15 09/28/89 930397	MW-16 09/28/89 930398
Volatile Organic Compounds (VOCs)								
Chloroethane	ug/]	NL	<100	<1.0	<10.0	<10.0	<1.0	5.7
Chloroform	ug/l	100	<100	<1.0	<10.0	<10.0	4.9	<1.0
,1-Dichloroethane	ug/l	NL	711	12.0	<10.0	35.9	66.4	265
,1-Dichloroethene Methylene Chloride ^b	ug/1	7.0	884 * 237	53.1 *	22.6 *	229 * 16.7	789 * <1.0	103 *
etnylene Chioride- etrachloroethene (PCE)	ug/1	NL NL	∠37 ∢100	<1.0 7.5	19.2 <10.0	31.3	97.6	<1.0 3.0
rans-1,2-Dichloroethene	ug/1 ug/1	NL	2,170	69.5	12.3	140	446	110
,1,1-Trichloroethane	ug/1	200	19,600 *	425 *	490 *	3.930 *	10.100 *	1,320 *
richloroethene (TCE) ^C	ug/1	5.0	15,500 *	3,150 *	863 *	13,800 *	116,000 *	1,144 *
inyl chloride	ug/1	2.0	<100	15.6 *	<u><10.0</u>	<10.0	<u> </u>	<u> </u>
otal VOCs ^d		NL	39,102	3,733	1,407	18,183	127,504	2,951

Notes:

USEPA MCL = United States Environmental Protection Agency Maximum Contaminant Level. NL ≈ No USEPA MCL is listed.

* = Compound detected above USEPA MCL.

a. MW-10B is a duplicate of MW-10A.

b. The method blank contained 2.8 ug/l of methylene chloride. This is equivalent to 28 ug/l, 280 ug/l, and 2800 ug/l in samples where the method detection limit was <10.0 ug/l, <100 ug/l, and <1,000 ug/l, respectively. Methylene chloride was also detected in the trip and field blanks at 1.2 ug/l.

was also detected in the trip and field blanks at 1.2 ug/l.
c. TCE was detected in the trip and field blank at 12.7 and 3.5 ug/l, respectively.

d. Total VOC values are rounded off to at least three significant figures.







TABLE 9

SUMMARY OF SEPTEMBER 28, 1989, GROUNDWATER QA/QC SAMPLE ANALYTICAL RESULTS

CHRISTIANA METALS CORPORATION BISHOP TUBE FACILITY FRAZER, PENNSYLVANIA

Sample ID: Sampling Date: BCM Sample Number:	Units	Trip Blank <i>09/28/89</i> 930399	Field Blank 09/28/89 930400
Volatile Organic Compounds (V	(OCs)	•	
Methylene chloride ^a	ug/1	1.2	1.2
Trichloroethene (TCE)	ug/1	12.7	3.5
Net as :			

Notes:

a. The method blank contained 2.4 ug/l of methylene chloride.





TABLE 10 SUMMARY OF MONITORING WELL CONSTRUCTION DETAILS AND MONITORED AQUIFERS

CHRISTIANA METALS CORPORATION BISHOP TUBE FACILITY FRAZER, PENNSYLVANIA

Well Identification	Depth to base of Well*	Depth to Top of Rock*	Depth of Monitored Interval*	Elevation of Top of Rock (AMSL)	Monitored Aquifer
MW-1	48		28-48		Rock
MW-2	24	13	15-24	371.00	Rock
MW-3	13.5	13	8-13.5	370.94	Unconsolidated
MW-4	20	9	7-20	377.74	Rock
MW5	20		10-20		Unconsolidated
MW-6	20.66		10.66-20.66		Unconsolidated
MW-7	19.8		9.8-19.8		Unconsolidated
MW-8	18		8-18		Unconsolidated
MW-9**	63	26	46-63	356.81	Rock
MW-10	15	4	5-15	380.56	Rock
MW-11	16	17	6-16	367.00	Unconsolidated
MW-12	21	20	8-21	363.15	Unconsolidated
MW-13	37	15	27-37	358.45	Rock
MW-14	15	15	5-15	358.18	Unconsolidated
MW-15	78	21	68-78	346.94	Rock
MW-16	21	17	7-21	350.91	Unconsolidated

Notes:

AMSL = Above mean sea level.

Feet below grade.MW-9 is an open rock well.





TABLE 11 SUMMARY OF GROUNDWATER ELEVATIONS

CHRISTIANA METALS CORPORATION BISHOP TUBE FACILITY FRAZER, PENNSYLVANIA

Well	Depth to Groundwater	(feet)a	Groundwater Elevation	(feet) ^b
No.	8/29/89 & 8/30/89	9/28/89	8/29/89 & 8/30/89	9/28/89
MW-1	13.25	NM	410.96	NM
MW-2	6.35	7.77	378.02	376.60
MW-3	6.10	7.51	378.56	377.15
NW-4	10.71	NM	376.37	NM
MW-5	12.10	NM	375.79	NM
MW-6	16.22	NM	372.26	NM
MW-7	12.62	NM	386.07	NM
MW-8	13.73	NM	370.41	NM
MW-9	15.45	NM	368.65	NM
MW-10	2.52	2.79	381.35	381.08
MW-11	9.01	8.64	374.41	374.78
MW-12	8.63	10.11	373.83	372.35
MW-13	10.32	13.29	364.51	361.54
MW-14	9.12	8.45	365.18	365.68
4W-15	*	A	*	*
MW-16	7.18	5.55	362.62	364.25

Notes:

* = An accurate water level measurement not available because the water level is above the casing.

NM = Not measured.

- a. Depth to water measured from the top of the inner well casing with electronic depth to water probes in all wells except MW-9 which is an open rock well and measurement was from top of protective steel casing.
- b. Elevations are referenced to the NGVD 1929.





TABLE 12
VERTICAL FLOW GRADIENT COMPUTATIONS

CHRISTIANA METALS CORPORATION BISHOP TUBE FACILITY FRAZER, PENNSYLVANIA

	Well Donth	Depth to Center of Monitored	Water Table E (AMSL)	levation
	(feet)	Interval (feet)	8/29/89 & 8/30/89	9/28/89
CLUSTER MW-2/MW-3				
MW-2: MW-3	24 13.5	19.50 10.75	378.02 <u>378.56</u>	376.60 <u>377.15</u>
Difference		8.75	-0.54	-0.55
Vertical Gradient 8/29/89 & 8/30/89:			-0.54/8.75 =	-0.0617
Vertical Gradient 9/28/89:			-0.55/8.75 =	-0.0628
CLUSTER MW-8/MW-9				
MW-9 MW-8	63 18	54.5 <u>13</u>	368.65 370.41	NM NM
Difference		41.5	-1.76	
Vertical Gradient 8/29/89 & 8/30/89:			-1.76/41.5 =	-0.0424





TABLE 12 (Continued)

	Well Depth	Depth to Center of Monitored Interval	Water Table El	evation
	(feet)	(feet)	8/29/89 & 8/30/89	9/28/89
CLUSTER MW-13/MW-14				
MW-13 MW-14	37 15	32 10	364.51 <u>365.18</u>	361.54 <u>365.68</u>
Difference		22	-0.67	-4.14
Vertical Gradient 8/29/89 & 8/30/89:			-0.67/22 =	-0.030
Vertical Gradient 9/28/89:			-4.14/22 =	-0.188
CLUSTER MH-15/MH-16				
MW-15* MW-16	78 21	73 <u>14</u>	369.68 <u>362.62</u>	369.68 <u>364.25</u>
Difference		59	+7.06	+5.43
Vertical Gradient 8/29/89 & 8/30/89:			+7.06/59 =	+0.119
Vertical Gradient 9/28/89:			+5.43/59 =	+0.092

Notes:

AMSL - Above mean sea level.

⁼ Groundwater surface in MW-15 is above the casing. Reported groundwater elevation is actually the elevation of the top of the inner casing.



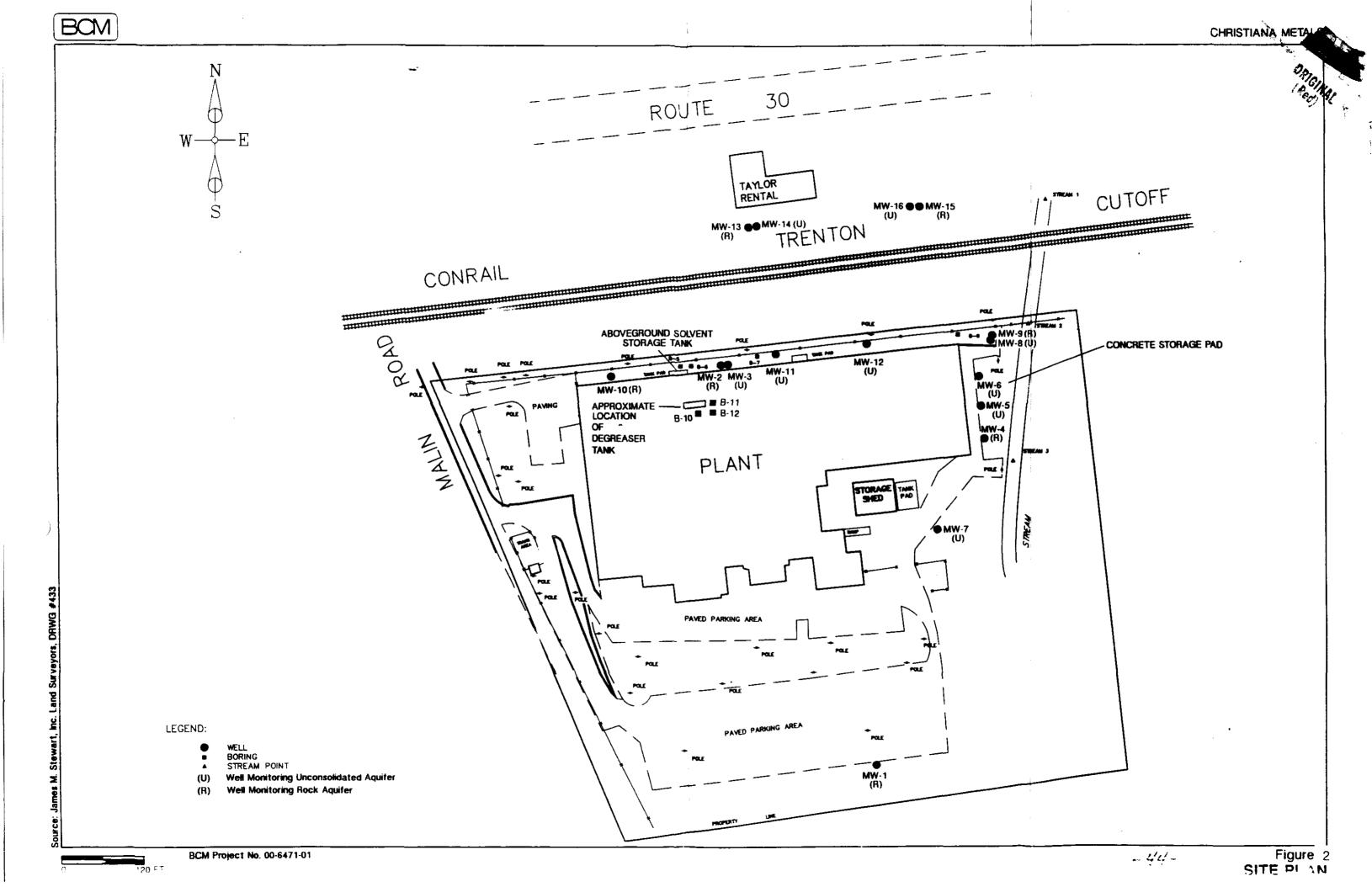


FIGURES

2000 Feet

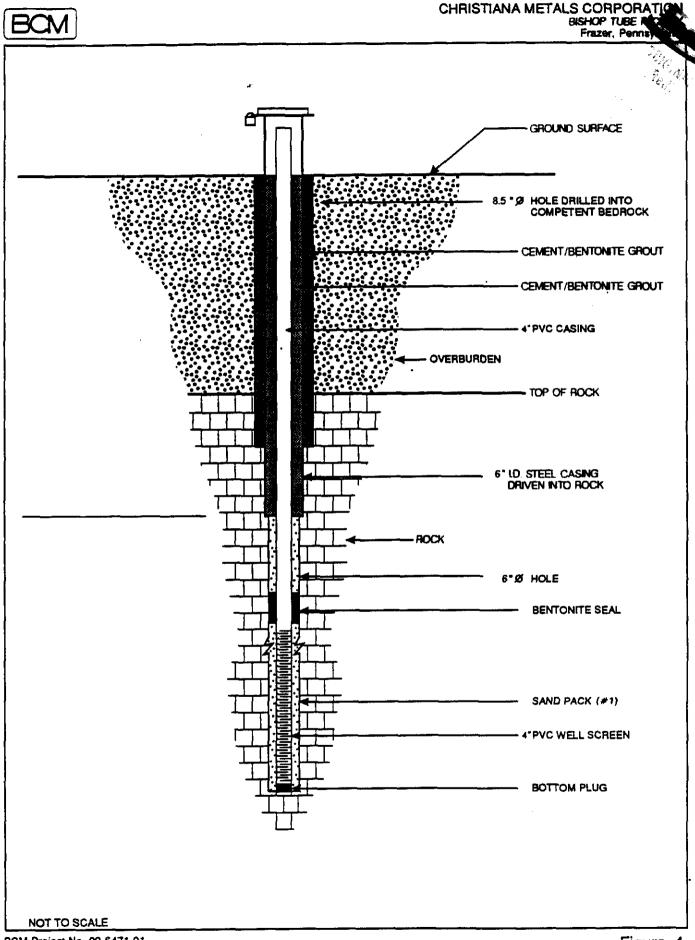
North





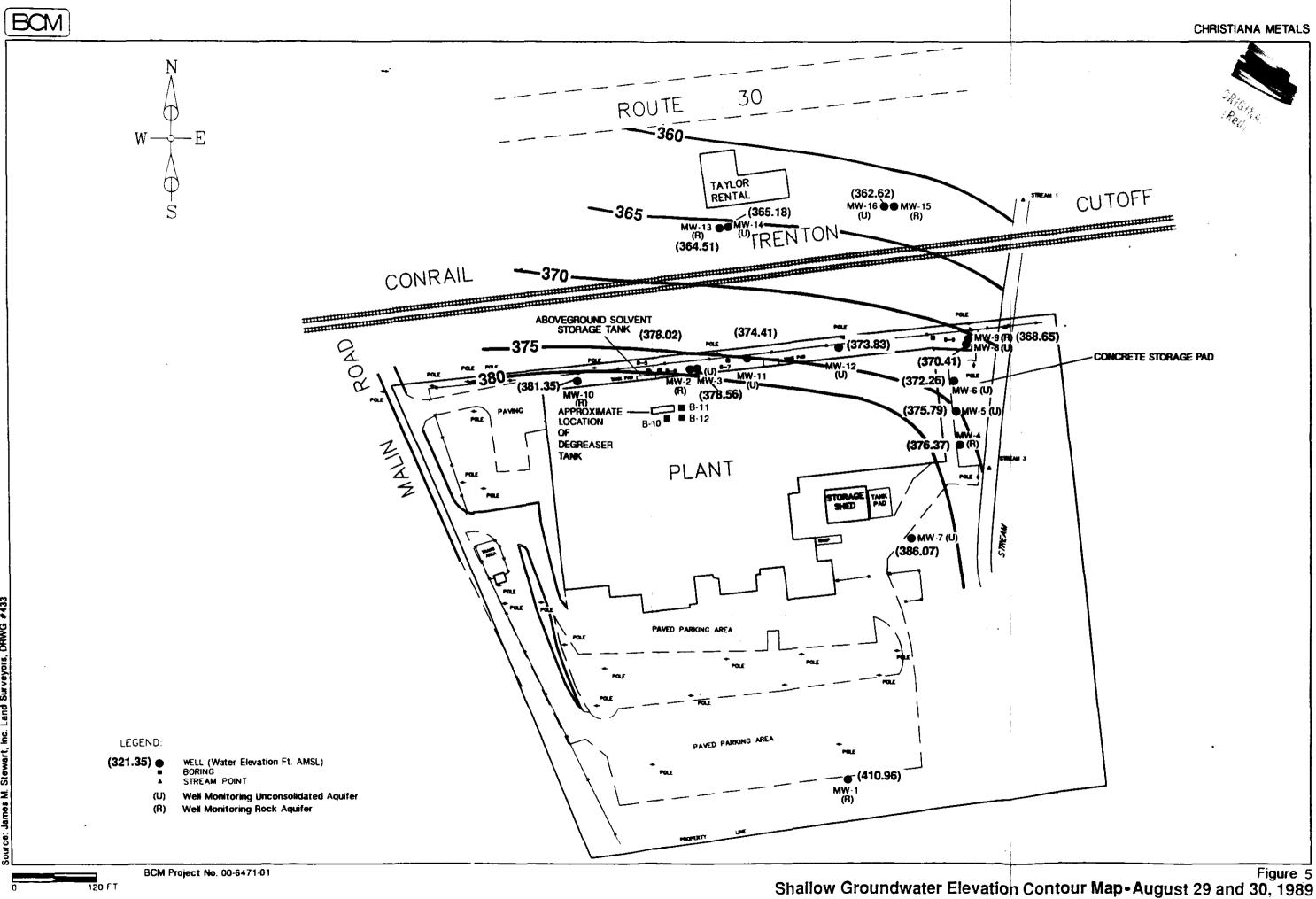
NOT TO SCALE
BCM Project No. 00-6471-01

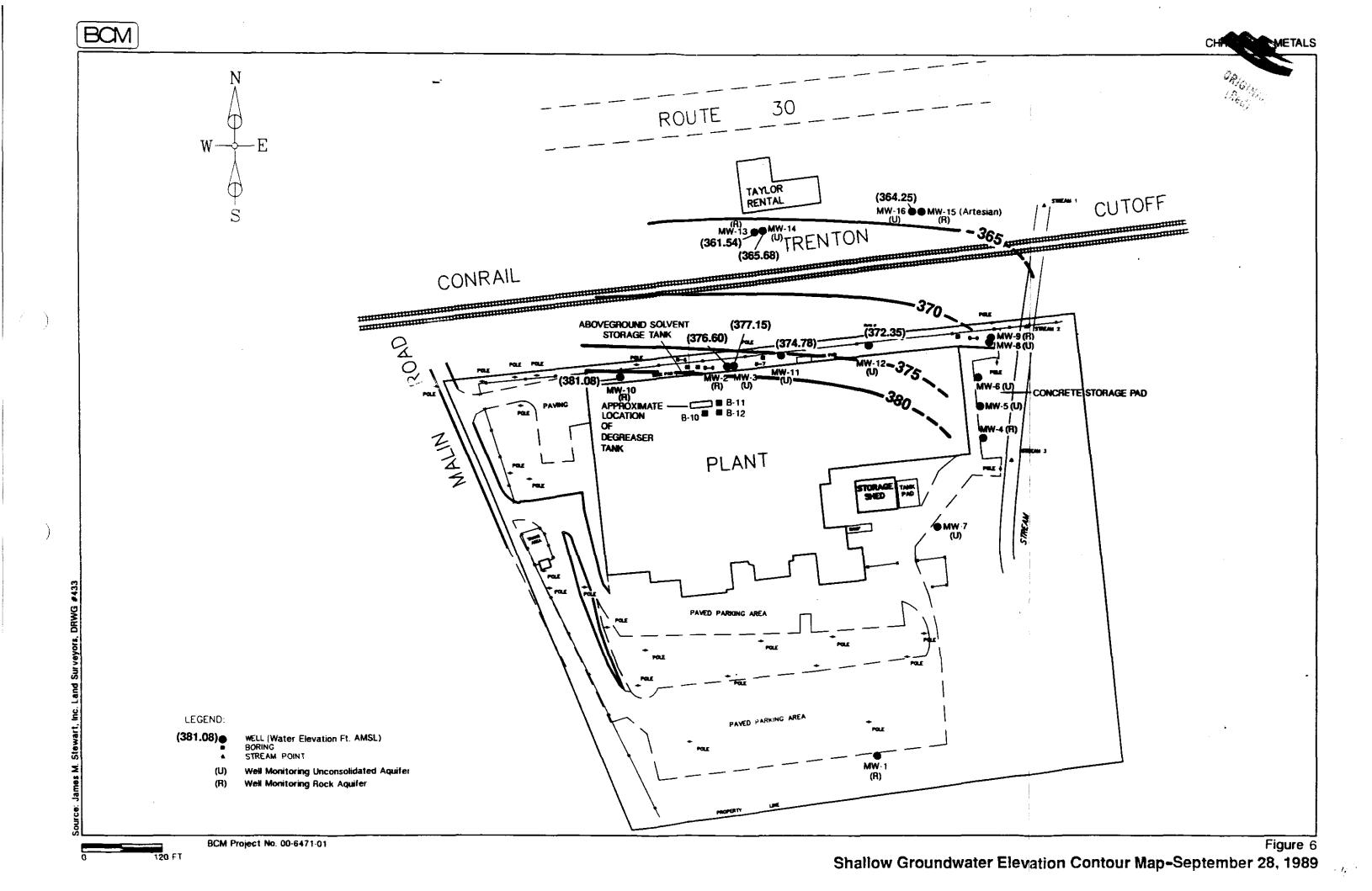
Figure 3
Schematic Unconsolidated Aquifer
Monitoring Well Construction Diagram

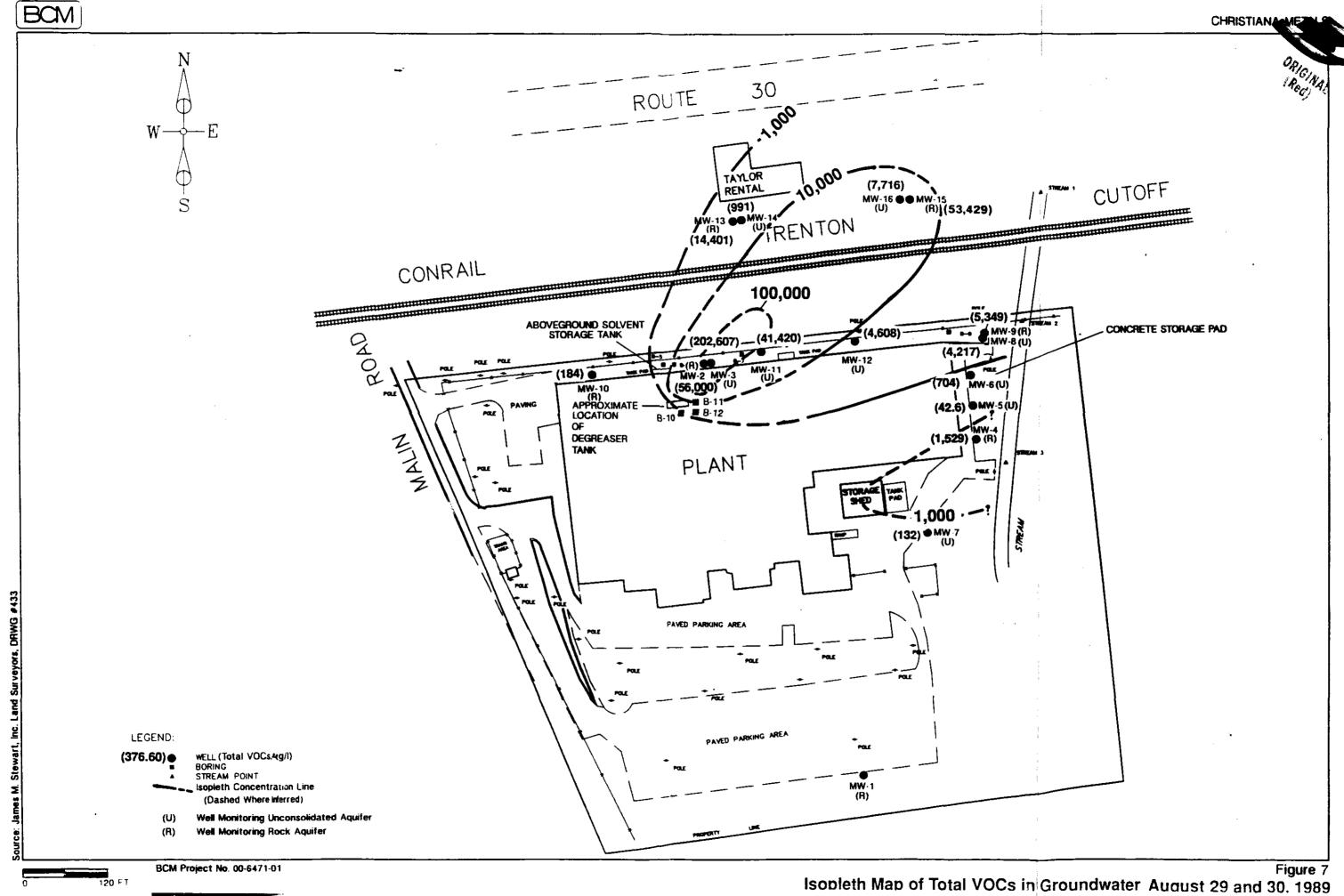


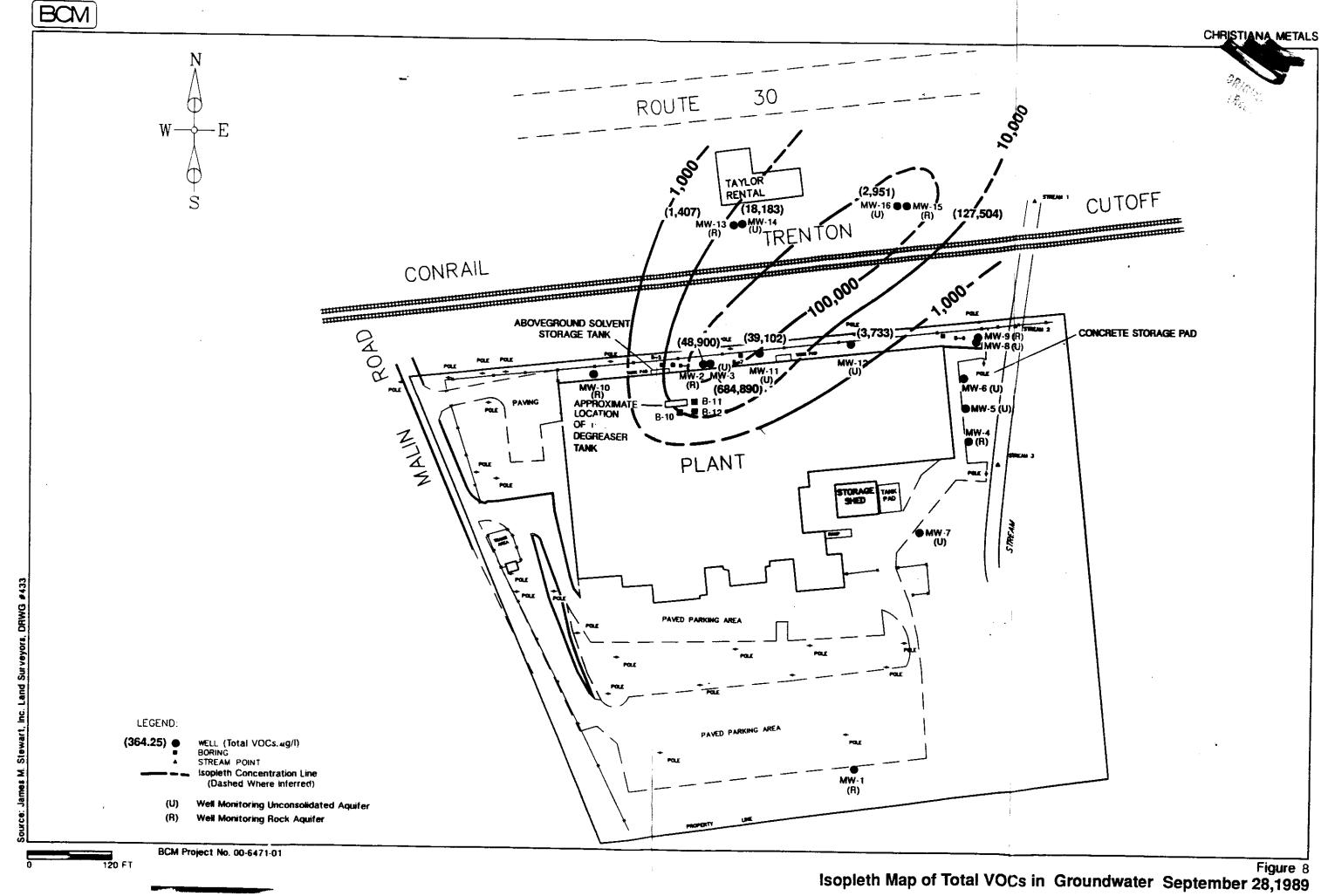
BCM Project No. 00-6471-01

Figure 4
Schematic Rock Aquifer
Monitoring Well Construction Diagram









- 50





APPENDIX A TEST BORING LOGS AND WELL DRILLING LOGS



	SHEET 1 OF 1
TEST BORING LOG	BORING NO: 8-5
PROJECT: Christiana Metals Corp. Groundwater Investigation	PROJECT NO: 00-6471-01
BORING LOCATION: tank along fire land	DATE(S) 8/1/89 DRILLED:
DRILLING CONTRACTOR: C.S. Garber and Sons, Inc.	DRILLING Hollow Stem Auger METHOD:
BORING 6.25" SAMPLING 2" O.D. Split-Spoon METHOD:	TOTAL 8' DEPTH:
BACKFILL MATERIAL Type I Portland Cement and Bentonite () AND METHOD:	
LOGGED BY: (b) (4) DEPTH TO STATIC WATER:	4.4 FT. BELOW GRADE

LITHOLOGIC INTERVAL	SAMPLE INTERVAL	SPOON BLOWS	RECOV- ERY	CLASSIFICATION
0-1'	0-2'	14,9,10,11	14"	FILL: Limestone gravel and sand
1-6'	2-4'	6,5,4,6	16"	<pre>CLAYEY SAND (SC): Fine, some very fine sand; little to some angular carbonate and schist</pre>
	4-6'	2,2,2,2	12"	clasts (1/8-1/2"); poorly sorted; orange brown, grey-blue; matrix, moderately plastic; clasts, dry.
6-8'	6-8'	2,3,2,1	10"	SILTY SAND (SM): Fine sand, some very fine sand, trace medium sand, trace carbonate and schist fragments (1/8-1/4:); poorly sorted; grey-brown matrix, brown to blue clasts, moist.
8'				END OF BORING. Limestone bedrock.
			:	
,				•

	P
	SHEET 1 OF
TEST BORING LOG	BORING NO: 8-6
PROJECT: Christiana Metals Corp. Groundwater Investigation	PROJECT NO: 00-6471-01
10' from B-5, adjacent to above ground BORING LOCATION: TCE tank along fire lane	DATE(S) DRILLED: 8/1/89
DRILLING CONTRACTOR: C.S. Garber and Sons, Inc.	DRILLING METHOD: Hollow Stem Auger
BORING SAMPLING 2" O.D. Split-Spoon	TOTAL DEPTH: 8.5'
BACKFILL MATERIAL Type I Portland Cement and Bentonite (10	
LOGGED BY: (b) (4) DEPTH TO STATIC WATER:4	.7 FT. BELOW GRADE
DEMADUS.	

LITHOLOGIC INTERVAL	SAMPLE INTERVAL	SPOON BLOWS	RECOV- ERY	CLASSIFICATION
0-1'	0-2'	12,9,9,8	12"	FILL: Limestone gravel and sand.
1-6'	2-4'	2,2,3,3	0"	CLAYEY SAND (SC): Fine, some very fine sand;
	4–6'	2,2,3,2	12"	little to some angular carbonate and schist fragments (1/8-1/2")' poorly sorted; orange-brown moderately plastic; matrix, grey-blue clasts; dry.
6-8.5'	6-8'	2,6,6,4	14"	SILTY SAND (SM): Fine sand, little very fine sand, trace mica; trace carbonate clasts (1/2-1"); yellow-brown matrix, grey-blue clasts; wet.
8.5'				END OF BORING. Limestone bedrock
,				
;				
				\
:				

- War
SHEET 1 OF
BORING NO: B-7
PROJECT NO: 00-6471-01
DATE(S) DRILLED: 8/2/89
DRILLING METHOD: Hollow-Stem Auger
TOTAL DEPTH:
0%); Pressure Grouted
B.O' FT. BELOW GRADE

LITHOLOGIC INTERVAL	SAMPLE INTERVAL	SPOON BLOWS	RECOV- ERY	CLASSIFICATION
0-1'	0-21	9,11,12,11	18"	FILL: Limestone gravel and sand
1-11'	2-4'	7,7,7,13	0"	CLAYEY SAND (SC): Fine, some to little very
•	4-5'	8,10,9,7	14"	fine sand, trace medium to coarse sand, little, angular carbonate clasts (1/8-1/2")
	6-8'	6,8,7,8	0"	trace angular schist fragments (1/8-1/4"); yellow-brown matrix, blue-grey to brown
	8-10'	3,5,7,7	16"	clasts, dry.
11-13.5'	10-12'	2,3,2,2	24"	SILTY SAND (SM): Fine, some very fine sand, trace angular schist clasts (1/8-1/4"), trace
13.5-14.5"	12-14'	1,3,31,7	18"	<pre>mica; dark grey; wet. SILTY GRAVEL (GM): Angular, pebble to cobble (1/4-1") size carbonate clasts, little medium to fine sand; clasts blue-grey; wet.</pre>
14.5'				END OF BORING. Limestone bedrock
	;			
j			:	
			:	N.

	SHEET 1 OF
TEST BORING LOG	BORING NO: B-9
PROJECT: Christiana Metals Corp. Groundwater Investigation	PROJECT NO: 00-6471-01
BORING LOCATION: At end of plant building along fire lane	DATE(S) 8/3/89 DRILLED:
DRILLING CONTRACTOR: C.S. Garber and Sons, Inc.	DRILLING Hollow-Stem Auger
BORING SAMPLING 2" O.D. Split-Spoon METHOD:	TOTAL 21' DEPTH:
BACKFILL MATERIAL T. T. Poutland Coment and Bentonita (10)	Y): Proceure Crouted

AND METHOD:

Type I Portland Cement and Bentonite (10%); Pressure Grouted

LOGGED BY:

(b) (4)

DEPTH TO STATIC WATER:14'

FT. BELOW GRADE

LITHOLOGIC	SAMPLE		RECOV-	acarrantia
INTERVAL	INTERVAL	SPOON BLOWS	ERY	CLASSIFICATION
0–1'	0-2'	8,5,5,5	12"	FILL: Limestone gravel and sand
1-9'	6-8'	3,4,8,8	16"	CLAYEY SILT (ML): Some very fine sand, little very angular 1/8-1/2" schist clasts; yellow-brown matrix, yellow-brown to red clasts; dry.
9-13'	10-12'	2,3,4,4	12"	SILTY CLAY (CL): Little very fine sand, trace very weathered schist clasts (1/8")
	12-14'	8,12,12,10	18"	yellow-brown matrix, very plastic; micaceous; moist.
13-16'				<u>SILTY GRAVEL (GM)</u> : Very angular carbonate clasts (>1"); little to some very fine
	14–16'	9,7,5,7	0"	sand, trace very coarse sand; yellow-brown matrix, blue-grey clasts; dry.
16-21'	20-22'	3,7,6,9	24"	<u>SAND (SM)</u> : Coarse to very coarse; micaceous, weathered muscoite schist grains, angular clasts of carbonate (1/2"); brown matrix; wet.
21'				END OF BORING. Limestone Bedrock
	<u> </u>			

	SHEET 1 OF
TEST BORING LOG	BORING NO: B-10
PROJECT: Christiana Metals Corp. Groundwater Inves	tigation PROJECT NO: 00-6471-01
BORING LOCATION: Inside of plant, adjacent to south side of degreaser	DATE(S) DRILLED: 8/18/89
DRILLING CONTRACTOR: J.E. Fritts and Associates	DRILLING METHOD: Hollow-Stem Auger
BORING SAMPLING 2" O.D. Split-Spoo	n DEPTH: 15'
BACKFILL MATERIAL Type I Portland Cement and Bento	
LOGGED BY: (b) (4)	TO WATER:N/A FT. BELOW GRADE

LITHOLOGIC INTERVAL	SAMPLE INTERVAL	SPOON BLOWS	RECOV- ERY	CLASSIFICATION
0-5' 5-14.5'	1-3' 3-5"	4,12,12,21 7,7,6,7	18" 24"	CLAYEY SILT (ML): Little fine to medium sand, trace angular schist clasts (1/8"); yellow-brown, moderately plastic matrix, white to grey clasts; dry. SAND (SM): Fine, some medium, little very
14.5'~15'				fine sand, trace coarse sand, micaceous; red-brown; wet; weathered schistose gruz. LIMESTONE: Angular clasts (1/2-1") of blue-grey limestone.
15'				END OF BORING
:		9		. N.

	SHEET 1 OF 1
TEST BORING LOG	BORING NO: B-11
PROJECT: Christiana Metals Corp. Groundwater Investigatio	PROJECT NO: 00-6471-01
Inside of plant, adjacent to northeast corner of degreaser	DATE(S) DRILLED: 8/18/89
DRILLING CONTRACTOR: J.E. Fritts and Associates	DRILLING METHOD: Hollow-Stem Auger
BORING DIAMETER: 3.25" SAMPLING METHOD: 2" O.D. Split-Spoon	TOTAL DEPTH:
BACKFILL MATERIAL AND METHOD: Type I Portland Cement and Bentonite (1)	
LOGGED BY: (b) (4) DEPTH TO STATIC WATER:	N/A FT RELOW GRADE

LITHOLOGIC INTERVAL	SAMPLE INTERVAL	SPOON BLOWS	RECOV- ERY	CLASSIFICATION
0-6.5'	1-3' 3-5'	18,20,19,10, 7,10,7,10, 4,4,4,8		CLAYEY SILT (ML): Some medium sand, little fine to very fine sand; trace angular schist clasts (1/8-1/2"); yellow-brown moderately plastic matrix, red-brown clasts; dry.
6.5-14'	7-9' 9-11'	7,6,4,4 1,1/12, 1	0" 6"	SAND (SM): Medium, some fine sand, little very fine sand, angular schist clasts (1/8-1/2"); micaceous, yellow brown to red-brown; wet at 7'.
14'	13-15'	1/18,2	6"	END OF BORING. Limestone bedrock.

	SHEET 1 OF 1
TEST BORING LOG	BORING NO: B-12
PROJECT: Christiana Metals Corp. Groundwater Investigation	PROJECT NO: 00-6471-01
BORING LOCATION: corner of degreaser	DATE(S) DRILLED: 8/18/89
DRILLING CONTRACTOR: J.E. Fritts and Associates	DRILLING Hollow-Stem Auger
BORING DIAMETER: 3.25" SAMPLING 2" O.D. Split-Spoon	TOTAL DEPTH:
BACKFILL MATERIAL Type I Portland Cement and Bentonite (10	%); Pressure Grouted
LOGGED BY: (b) (4) DEPTH TO STATIC NATER:	I/A FT. BELOW GRADE
REMARKS:	

LITHOLOGIC INTERVAL	SAMPLE INTERVAL	SPOON BLOWS	RECOV- ERY	CLASSIFICATION
0-6.5'	1-3' 3-5' 5-7'	7,9,10,15 13,14,17,15 3,4,4,4	0" 12" 12"	CLAYEY SILT (ML): Some fine sand, little to trace angular schist clasts (1/8-3/4" yellow-)brown moderately plastic matrix, red-brown clasts; dry.
6.5-9' 9'	7-9'	4,4,3,4	*81	SAND (SM): Medium, some fine sand, little very fine sand; micaceous; red-brown; wet at 7'. END OF BORING
				•

	On the
PCM WELL DRILLING LOG	WELL NO:
WELL DRILLING LOG	SHEET 1 OF: 1
PROJECT: Christiana Metals Corp. Groundwater Investigation	PROJECT NO: 00-6471-01
WELL LOCATION: Adjacent to west end of plant along F.L.	DATE(S) 8/4/89 DRILLED
DRILLING CONTRACTOR: C.S. Garber and Sons, Inc.	DRILLING Air Percussion METHOD
BORING 8.5" SAMPLING N/A DIAMETER: METHOD:	SAMPLE N/A INTERVAL:
LOGGED BY:	TOTAL 15' DEPTH:
SCREEN SIZE 0.020" slot, 4" I.D. schedule 40 PVC AND MATERIAL:	SCREENED 5-15' INTERVAL:
CASING SIZE 4" I.D. schedule 40 PVC AND MATERIAL:	CASED 0-5' INTERVAL:
GRAVEL Jessie Morie #1 silica sand PACK SIZE:	PACKED 4-15' INTERVAL:
GROUT TYPE: Type I Portland Cement and Bentonite (10%)	GROUTED 0-3'
GROUTING Pressure grout METHOD:	BENTONITE 3-4' SEAL:
DEVELOPMENT Centrifugal pump TIME: 30 mins. METHOD:	ESTIMATED 25 gpm YIELD:
WATER DEPTH:	RENCE: Top of PVC
REMARKS: A hollow-stem auger rig equipped with a 2-inch the first four feet of the hole.	O.D. split-spoon completed

LITHOLOGIC INTERVAL	SAMPLE INTERVAL	SPOON BLOWS	RECOV- ERY (IN.)	CLASSIFICATION OF MATERIALS
0-1' 1-4'		18,12,9,14 9,9,8,10	18" 12"	FILL: Limestone gravel and sand. SILTY SAND (SM): Fine, some very fine sand, little clay, trace to little angular carbonate clasts (1/8-1/4"); grey brown matrix, moderately plastic, orange-brown to
4–15' 15'				grey clasts; dry. Limestone END OF BORING. Limestone bedrock.

	To the							
BCM WELL DRILLING LOG								
PROJECT: Christiana Metals Corp. Groundwater Investigation								
it of plant along	DATE(S) DRILLED 8/2/89							
and Sons. Inc.	DRILLING METHOD Hollow-Stem Auger							
BORING SAMPLING DIAMETER: 6.25" SAMPLING METHOD: 2" O.D. split-spoon								
	TOTAL DEPTH: 16'							
schedule 40 PVC	SCREENED INTERVAL: 6-16'							
PVC	CASED Interval: 0-6'							
and	PACKED INTERVAL: 4-16'							
GROUT TYPE: Type I Portland Cement and Bentonite (10%)								
GROUTING METHOD: Pressure grout								
TIME: 1 hou	r YIELD: <1 gpm							
DATE: 8/10/89	REFERENCE: Top of PVC							
֡֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜	and Sons. Inc. 2" O.D. split- schedule 40 PVC VC and Bentonite (10							

LITHOLOGIC INTERVAL	SAMPLE INTERVAL	SPOON BLOWS	RECOV- ERY (IN.)	CLASSIFICATION OF MATERIALS
0-1'	0–2 '	3,7,12,14	4"	FILL: Limestone gravel and sand.
	4-6'	5,10,11,13	18"	<u>CLAYEY SAND (SC)</u> : Fine, some very fine sand, little silt, trace weathered angular
1-10'	8-10'	3,6,5,6	20"	schist clasts (1/8-1/4"), yellow-brown moderately plastic matrix; gray-blue clasts; dry.
10-15.5'	10-12'	B,2,1,2	2"	SILTY SAND (ML): Fine, some very fine sand, micaceous, trace schist clasts (1/8") grey-
	12-14'	3,4,3,2	12"	black; wet at 13'.
15.5-17'	14-16'	,1,2,4	2"	CLAYEY SILT (CL): Trace very fine sand, trace angular schist clasts (1/2-1") yellow-
ľ	16-18'	1,31/3"	2"	brown matrix, grey-brown clasts, wet.
17'				END OF BORING. Limestone bedrock.

ORIGINAL LANGE
They the

	· · · · · · · · · · · · · · · · · · ·
PCM WELL DRILLING LOG	WELL NO: MM-12
	SHEET 1 OF: 2
PROJECT: Christiana Metals Corp. Groundwater Investigation Adjacent to east end of plant along	PROJECT NO: 00-6471-01
WELL LOCATION: fire lane	DATE(S) 8/3/89 DRILLED
DRILLING CONTRACTOR: C.S. Garber and Sons, Inc.	DRILLING Hollow-Stem Auger
BORING 6.25" SAMPLING 2" O.D. split-spoor METHOD:	SAMPLE Continuous INTERVAL:
LOGGED BY: (b) (4)	TOTAL 21' DEPTH:
SCREEN SIZE 0.020" slot, 4" I.D. schedule 40 PVC AND MATERIAL:	SCREENED 8-21' INTERVAL:
CASING SIZE 4" I.D. schedule 40 PVC AND MATERIAL:	CASED 0-8' INTERVAL:
GRAVEL Jessie Morie #1 silica sand PACK SIZE:	PACKED 6-21' INTERVAL:
GROUT TYPE: Type I Portland Cement and Bentonite (10%)	GROUTED 0-4' INTERVAL:
GROUTING Pressure grouted METHOD:	BENTONITE 4-6' SEAL:
DEVELOPMENT Centrifugal pump TIME: 1 hour METHOD:	ESTIMATED <1 gpm YIELD:
STATIC 9.2' DATE: 8/10/89 REFE	RENCE: Top of PVC

LITHOLOGIC INTERVAL	SAMPLE INTERVAL	SPOON BLOWS	RECOV- ERY (IN.)	CLASSIFICATION OF MATERIALS
0-1'	0-2	12,11,10,10 5,8,8,12	14" 18"	FILL: Gravel and sand CLAYEY SILT (ML): Some very fine sand,
	4-6'	5,6,5,6	8"	trace angular schist clasts (1/8-1/2") yellow-brown matrix, blue-grey clasts; dry.
7-8.5'	6-8' 8-10'	2,3,3,5 8,14,9,3	14"	SILTY CLAY (CL): Trace very fine sand, trace angular schist clasts (1/8"); yellow-brown, very plastic matrix; moist.
8.5-10'	10–12'	1/24"	24"	CLAYEY GRAVEL (GC): angular schist clasts (1/2-1"); little very fine sand; micaceous; yellow-brown moderately plastic matrix; dry.

WELL NO. MW-12

SHEETRICE OF 2

				SHEE ING.
LITHOLOGIC INTERVAL	SAMPLE INTERVAL	SPOON BLOWS	RECOV- ERY (in.)	CLASSIFICATION
10-211	12-14"	4,1,2,8	24"	SAND (SM): Medium, some coarse sand, little fine sand, trace clay and silt,
	14-16'	2,3,10,17	24"	little fine sand, trace clay and silt, trace angular schist clasts (1/8-1/4"), micaceous, gray-brown; wet; weathered
	16-18'	2/24"	2"	schistose grains.
	18-20'	1,7,1/12"	24"	
	20-221	50/0"	0"	Augered to 21'.
21'				END OF BORING. Limestone bedrock.
:				
:				
		j		
			}	
V.				
			1	
ĺ				
			ľ	
	;	·		



(E	BOM	WELL D	RILLIN	G LOG	WELL NO: MM-13 SHEET OF:
					SHEE! OF:
PROJECT:	Christian	na Metals Cor	p. Grow	ndwater Investigat	
WELL LOC	ATION: 01	DATE(S) DRILLED 8/7/89			
DRILLING C	ONTRACT	DRILLING METHOD Air Percussion			
BORING		SAMPLE			
DIAMETER:	8.5"	METHOD:		N/A	INTERVAL: N/A
LOGGED BY		<i>j</i>			DEPTH: 37'
SCREEN SIZ AND MATER		0" slot. 4"	I.D. sc	hedule 40 PVC	INTERVAL: 27-37'
CASING SIZ		.D. schedule	40 PVC		CASED INTERVAL: 0-27'
GRAVEL PACK SIZE:		Morie #1 sil		d	PACKED INTERVAL: 25-37'
GROUT TYP	· E ·				GROUTED
GROUTING			ement a	nd Bentonite (10%)	BENTONITE
METHOD: DEVELOPM	Pressure	grouted			SEAL: 23-25' ESTIMATED
METHOD:	Subn	mersible pump)	TIME: 1 hour	YIELD: <1 qpm
STATIC WATER DEF	тн: 10.0	,,	DA	TE: 8/10/89 RE	FERENCE: Top of PVC
LITHOLOGIC INTERVAL	SAMPLE INTERVAL	SPOON BLOWS	RECOV- ERY (IN.)	gy from 0-15' see	CATION OF MATERIALS
0-15' 15-37' 37'				Overburden (see in Limestone bedrock water) END OF BORING	W-14 log) :: void from 27-28' (first

							ORIGINAL TOPOLOGICAL OPOLOGICA TOPOLOG	
Œ	3GM	WELL D	RILLIN	G LOG		WELL NO:	MW_14 OF:	
PROJECT:						PROJECT N	۱	
WELL LOC	ATION: 01			indwater Invest: IM-13 at west ei		DATE(S) DRILLED	00 <u>-6471-01</u> 8/7/89	
DRILLING C		DRILLING METHOD HO	ollow-Stem Auger					
BORING DIAMETER:	6.25"	SAMPLING METHOD:		d Sons, Inc. 2" O.D. spli	t-spoor	SAMPLE		
LOGGED BY	(b)					TOTAL DEPTH:	15'	
SCREEN SIZ		20" slot, 4"	I.D. sc	hedule 40 PVC		SCREENED INTERVAL:	5+15'	
CASING SIZ		I.D. schedule	40 PVC	·		CASED INTERVAL:	0-5'	
GRAVEL PACK SIZE:	Jessie	Morie #1 si	lica san	ıd		PACKED INTERVAL:	3-15'	
GROUT TYP	E: Type	I Portland (Cement a	und Bentonite (10%)	GROUTED INTERVAL:	0-2'	
GROUTING METHOD:	Pressure	grouted				BENTONITE SEAL:	2-31	
DEVELOPM METHOD:	ENT Cent	trifugal pump		TIME: 1 ho	our	ESTIMATED YIELD:	<1 gpm	
STATIC WATER DEF	PTH: 15.0	o•	DA	TE: 8/10/89	REFE	RENCE: To	op of PVC	
REMARKS:	.		,					
LITHOLOGIC INTERVAL	SAMPLE INTERVAL	SPOON BLOWS	RECOV- ERY (IN.)	CLAS	SIFICA	TION OF MATE	RIALS	
0–10'	5~7'	4,8,10,12	6"	CLAYEY SILT (ML): Some very fine sand, little angular schist clasts (1/8-1/4") yellow-brown matrix, moderately plastic; dry.				
10-15'	10-12'	2,1,1,3	12"	SAND (SM): N silt to clay, brown-grey; w	moder			
	15-17'	50/0"						

END OF BORING. Limestone bedrock.

15'



				The State of the S					
BAM)	WELL D	RILLIN	IG LOG	WELL NO: MW-15					
Christian	a Matals Cor	n Grou	ndwater Investig	PROJECT NO:					
ATION	DATE(S) ORILLED 8/7/89								
	DRILLING METHOD Air Percussion								
0 511	SAMPLING			SAMPLE INTERVAL: N/A					
				TOTAL					
ZE	0" slat 4"	T D ec	hadula 40 DVC	SCREENED INTERVAL: 68-78'					
E				CASED INTERVAL: 0-68'					
				PACKED INTERVAL: 66-78'					
E: Type	I Portland C	ement a	nd Bentonite (10	GROUTED					
				BENTONITE SEAL: 64-66''					
ENT	-		TIME.	ESTIMATED					
TH: 0.04	•	D/	TE: 8/10/89	REFERENCE: Top of PVC					
REMARKS: For description of lithology see log for MM-16. LITHOLOGIC SAMPLE SPOON REOMS RECOV- CLASSIFICATION OF MATERIALS									
		(11.7)	ł	MM-16 log). ock: void at 68 to 69-feet					
	ATION: Of CONTRACTOR 8.5" E. S. S. S. S. S. S. S. S. S. S. S. S. S.	Christiana Metals Cor ATION: Offsite at eas CONTRACTOR: C.S. Ga 8.5" SAMPLING METHOD: CENTRACTOR: C.S. Ga SAMPLING METHOD: CENTRACTOR: C.S. Ga SAMPLING METHOD: CENTRACTOR: C.S. Ga SAMPLING METHOD: CENTRACTOR: C.S. Ga SAMPLING METHOD: CENTRACTOR: SAMPLING CENTRACTOR: C.S. Ga SAMPLE SPOON BLOWS SAMPLE SPOON BLOWS SAMPLE SPOON BLOWS	Christiana Metals Corp. Group ATION: Offsite at east end of CONTRACTOR: C.S. Garber and SAMPLING METHOD: SAMPLING METHOD: Jessie Morie #1 silica sande: Type I Portland Cement and Pressure grouted with tremminant Submersible pump TH: 0.04' For description of lithological SAMPLE SPOON BLOWS RECOV-	CONTRACTOR: C.S. Garber and Sons. Inc. SAMPLING METHOD: N/A C: SAMPLING METHOD: N/A C: SAMPLING METHOD: N/A C: SAMPLING METHOD: N/A C: SAMPLING METHOD: N/A C: SENAL: O.020" slot, 4" I.D. schedule 40 PVC Jessie Morie #1 silica sand CE: Type I Portland Cement and Bentonite (107) Pressure grouted with tremmie ENT Submersible pump TIME: OATE: SAMPLE INTERVAL SPOON BLOWS RECOV- ERY (IN.) Overburden (see Limestone bedrown of first water).					



							The state of the s
E	3GM	WELL D	RILLIN	G LOG		WELL NO:	MW-16 OF:
PROJECT:	Christia	na Metals Con	ro. Grou	ndwater Investig	ation	PROJECT NO	: 00-6471-01
WELL LOC		ffsite adjace f Taylor Reni		W-15 at east end	i	DATE(S) DRILLED	8/8/89
DRILLING C		OR:		d Sons, Inc.		DRILLING	low-Stem Auger
BORING DIAMETER:	6.25"	SAMPLING METHOD:	3	2" O.D. split-	snoon	SAMPLE	çı
LOGGED BY					- 4000	TOTAL	1'
SCREEN SIZ	ZE	On slot An	T D sc	hedule 40 PVC		SCREENED INTERVAL:	7-21'
CASING SIZ	E	.D. schedule				CASED INTERVAL:	0-7'
GRAVEL PACK SIZE:		Morie #1 sil				PACKED INTERVAL: 5	
GROUT TYP	E: Type	I Portland (ement a	nd Bentonite (10	1%)	GROUTED INTERVAL:	0-31
GROUTING METHOD:	Pressure	grouted				BENTONITE SEAL:	3-5'
DEVELOPM METHOD:	ENT Cent	rifugal pump)	TIME: 1 hou		ESTIMATED YIELD:	<1 gpm
STATIC WATER DEF	TH: 7.5		DA	TE: 8/10/89	REFE	RENCE: Top	of PVC
REMARKS:							
LITHOLOGIC INTERVAL	SAMPLE INTERVAL	SPOON BLOWS	RECOV- ERY (IN.)	CLASS	IFICAT	TION OF MATER	IALS
0-10.5'	5-7'	4,7,18,15	18"	CLAYEY SILT (C clasts (1/8-1/	<u>'L)</u> : '4"); (Trace angular damp; grey mo	schist ttling.
10.5-15'	10-12'	1,2,1,3	20"	CLAYEY SILT (C highly plastic			
15-17'	15-17'	1/24"(W.O.H.) 24"	<u>SILTY SAND (SM</u> schist clasts			
17-21'	20-22'	1,2,1,1	18"	LIMESTONE BEDR	OCK:	Weathered li	mestone.
21'				END OF BORING			





APPENDIX B HEALTH AND SAFETY PLAN





HEALTH AND SAFETY PLAN

FOR

CHRISTIANA METALS CORPORATION BISHOP TUBE FACILITY FRAZER, PENNSYLVANIA

JUNE 27, 1989

BCM PROJECT NO. 00-6471-01

PREPARED BY:

(D) (4_.

SENIOR HEALTH AND SAFETY SPECIALIST

AND

(b) (4)

HEALTH-AND SAFETY DIRECTOR





1.0 BACKGROUND

SITE: Bishop Tube Facility
LOCATION: Frazer, Pennsylvania
PROJECT DESCRIPTION: Groundwater Investigation
PROPOSED STARTUP DATE: 7/6/89 PROJECTED LENGTH OF WORK: 3 weeks
FACILITY DESCRIPTION: The facility is a redraw mill that fabricates
speciality items in the stainless steel tubing field.
Unusual Features (containers, buildings, underground tanks, dikes, power lines, terrain, etc.) <u>Underground and overhead utilities and close proximity to railroad power</u>
lines.
Status: (X) Active () Inactive
Overall Hazard is: High: Moderate: X Unknown:
Site History (worker or non-worker injury; complaints from public; previous agency action):
In May of 1988. BCM performed a groundwater quality investigation at the Bishop Tube facility. Results of the investigation indicate that Bishop Tube is the apparent source of trichloroethene (TCE) and 1.1.1-trichloroethane (TCA) contamination.





2.0 SCOPE OF WORK

BCM Engineers Inc. (BCM) has been retained by Christiana Metals Corporation to perform additional investigative tasks at the Bishop Tube The purpose of the facility located in Frazer, Pennsylvania. is to further delineate soil and groundwater BCM will oversee the installation of five groundwater delineate investigation is contamination. monitoring wells. Three shallow monitoring wells will be installed on the north side of the plant with a cluster of two wells, one shallow and one deep installed on the northeast side of the facility close to the small stream and one cluster of a deep and shallow well approximately midway in front of the plant. All shallow wells will be drilled using hollow stem augers and the deep wells drilled utilizing air rotary. Soil sampling will be performed continuously using split spoon samplers. In addition, BCM will perform groundwater sampling of all existing and newly installed monitoring wells.

2.1 PERSONNEL INVESTIGATING SITE

Name :(b) (4)	Position: Project Geologist
(b) (4)	Field Geologist





2.2 HAZARD EVALUATION

The following substances have been detected in groundwater samples collected at the site. The primary hazards of each are identified.

Chemical	OSHA PEL ACGIH TLV ACGIH STEL NIOSH IDLH	Primary Hazards
CHLOROFORM CAS: 67-66-3	PEL: 2 ppm TLV: 10 ppm STEL: None IDLH: None CA	Poison to humans by in- gestion and inhalation. Human central nervous system (CNS) effects and systemic effects.
CHLOROETHANE (ETHYL CHLORIDE) CAS: 75-00-3	PEL: 1,000 ppm TLV: 1,000 ppm STEL: None IDLH: 20,000 ppm	Moderately toxic by ingestion and inhalation routes. An irritant to skin, eyes, and mucous membranes.
1,1 DICHLOROETHANE CAS: 75-34-3	PEL: 100 ppm TLV: 200 ppm STEL: 250 ppm IDLH: None	Moderate toxicity by ingestion. Explosive when exposed to heat. Dangerous when heated to decomposition; it emits phosgene fumes. Colorless liquid.
1,2 DICHLOROETHANE (ETHYLENE DICHLORIDE) CAS: 107-06-2	PEL: 1 ppm TLV: 10 ppm STEL: 2 ppm IDLH: None CA	Toxic by ingestion, inhalation, and skin absorption. Strong irritant to eyes and skin. A carcinogen. Colorless liquid. Flammable, dangerous fire risk, explosive limits in air 6-16%.
1,1-DICHLOROETHYLENE (VINYLIDENE CHLORIDE) CAS: 75-35-4	PEL: 1 ppm TLV: 5 ppm STEL: 20 ppm IDLH: None	Poison by inhalation and injestion. An experimen-tal carcinogen and mutagen by skin contact, inhalation, and other routes. A dangerous fire hazard when exposed to heat and flames.





Hazard Evaluation Continued (Page 2)

	OSHA PEL ACGIH TLV	
Chemical	ACGIH STEL NIOSH IDLH	Primary Hazards
1,2 DICHLOROETHENE CAS: 540-59-0	PEL: 200 ppm TLV: 200 ppm STEL: None IDLH: 4,000 ppm	Toxic by inhalation, ingestion, and skin contact; irritant. Narcotic in high concentrations. Flammable, dangerous fire risk.
METHYLENE CHLORIDE CAS: 75-09-2	PEL: 500 ppm TLV: 175 ppm STEL: None IDLH: None CA	Moderately toxic by inhalation and other routes; poison by ingestion and intervenous routes. Blood and central nervous system (CNS) effects by inhalation. An eye and skin irritant. A suspect human carcinogen. Narcotic, dizziness, nausea, dermatitis.
TETRACHLOROETHENE (PCE) CAS: 127-18-4	PEL: 25 ppm TLV: 50 ppm STEL: 200 ppm IDLH: None	Toxic by inhalation, ingestion, or repeated skin contact. Exposure to high concentrations can cause irritation to eyes, nose, and throat. Colorless liquid.
1,1,1-TRICHLOROETHANE (METHYL CHLOROFORM) CAS: 75-55-6	PEL: 350 ppm TLV: 350 ppm STEL: 450 ppm IDLH: 1,000 ppm	Toxic by inhalation. A moderate skin and severe eye irritant. CNS effects. Narcotic in high concentrations. Colorless liquid.
TRICHLOROETHENE (TCE) CAS: 79-01-6	PEL: 50 ppm TLV: 50 ppm STEL: 200 ppm IDLH: None CA	Non-flammable. CNS depressant. Skin and eye irritant. Chloroform—like odor. Suspect animal carcinogen. Toxic by inhalation.





Hazard Evaluation Continued (Page 3)

Chemical	OSHA P ACGIH ACGIH NIOSH	TLV STEL	Primary Hazards
TRICHLOROFLUOROMETHANE CAS: 75-69-4	TLV: STEL:		High concentrations cause narcosis and anesthesia. Dangerous when heated to decomposition; it emits toxic fumes.
VINYL CHLORIDE CAS: 75-01-4	PEL: TLV: STEL: IDLH:	1 ppm 5 ppm 5 ppm None CA	A human brain carcinogen. A severe irritant by inhalation to skin, eyes and mucous membranes. Causes skin burns by rapid evaporation and consequent freezing.

- OSHA PEL = Occupational Safety and Health Administration Permissible Exposure Limit for an 8-hour time-weighted average.
- ACGIH TLV = American Conference of Governmental Industrial Hygienists
 Threshold Limit Value for an 8-hour time-weighted average.
- ACGIH STEL = American Conference of Governmental Industrial Hygienists Short Term Exposure Limit for a 15-minute time-weighted average.
- NIOSH IDLH = National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health Concentration
 - CA = NIOSH has identified numerous chemicals that they recommend shall be treated as potential human carcinogens.
 - NOTE: Material Safety Data Sheets can be obtained by request from the BCM Information Center upon contacting the BCM Safety Department.

The following additional hazards are expected onsite:

Caution must be given to overhead and underground utilities





See

2.3 PERSONNEL PROTECTIVE EQUIPMENT

					•																	
<u>LE</u> \	/EJ	LO	F . P!	ROTE	CTIO	N																
В	()	С	()	D	(X) I	Loca	tio	n/Ac	tiv	ity		SHAL INST				RIN	IG I	NEL	L	
				ing																		1 D
res	S D	ra	tor	<u>V D</u>	rote	cti	on	Wi	th	the	. a	S 500	cia	ted	de	rmal		rot	ect	10	n	See
Sec	ct.	on	2.	4 fo	r ac	tio	n 1	evel	rec	ou i r	eme	nts	,	_			•					
В	()	С	(X)	D	()	Loca	tio	n/Ad	:tiv	ity		DEEP INST				IG H	IELL	-		
The	. (dri	111	na o	f bo	oth	dee	D W	e 1 1 s	. Wi	11	be_	int	tlai	ed	at_	Lev	e l	C r	esi	oira	tory
				wit	_						-											ired
	_												_					_				air
																						1 be
																						for
									1121		<u> </u>	<i>.</i>	<u> </u>	<u>eeus</u>	<u> </u>	7.5	<u> </u>	766	<u> </u>	ш	<u> </u>	
لخد	<u></u>	<u> </u>	EA	el r	EUU L	1.50	en C	.														

B () C () D (X) Location/Activity: MONITORING WELL SAMPLING

The level of protection to be utilized during monitoring well sampling will be directly dependant on the level used to install the wells. However, it is anticipated that Level D will be utilized during sampling with continuous monitoring of the workers' breathing zone. See Section 2.4 for action level requirments.

B () C (X) D () Location/Activity: DECONTAMINATION OF HEAVY **EQUIPMENT**

Heavy equipment that comes in contact with potentially contaminated materials must be decontaminated at Level C respiratory and dermal protection. If volatile organic concentrations are not detected above the set action levels, decontamination will be performed using a splash shield with dermal protection.





RESPIRATOR () N/A	
(X) Full-Face Respirator (Level C) (MSA Cartridge <u>GMC-H</u>)	() Half-Face Respirator (MSA Cartridge)
() Self-Contained Breathing Apparatus	() Escape Mask
() Airline Respirator	
NOTE: GMC-H = organic vapor/acid gas See Attachment A for respirate negative fit test/procedures.	high efficiency particulate filter or inspection check list and positive
CLOTHING () N/A	
() Tyvek Coverall	() Fully Encapsulating Suit
(X) Polycoated Tyvek Coverall	() Chemical-Resistant Splash Suit
() Saranex Coverall	() Other
NOTE:	
HAND PROTECTION () N/A	
(X) Undergloves <u>Latex</u> Type	(X) Overgloves <u>Nitrile</u> Type
() GlovesType	() Other
FOOT PROTECTION () N/A	
(X) Safety Workboots/Shoes	() Heavy Outer Boots
(X) Disposable Overboots	() Other





HEAD. EYE. & HEARING () N/A

(X) Hard Hat	() Chemic	al Splash Goggle
--------------	------------	------------------

- (X) Hearing Protection (as needed) (X) Safety Glasses (NIOSH or ANSI
 - (X) Face Shield (Decontamination)

NOTE: Safety glasses must be worn if eye protection is not afforded by a full-face respirator.

2.4 MONITORING EQUIPMENT () N/A

- (X) Photoionization Detector (HNu PI-101)
- (X) Flame Ionization Detector (Century Organic Vapor Analyzer)
- (X) Combustible Gas/Oxygen/Hydrogen Sulfide Meter (MSA Model 361)
- () Radiation Meter (Ludlum Model 3 Survey Meter)

()	Detector	Tubes	(Type	-)

() Other:_____

NOTE: Real-time monitoring of volatile organics will be performed using an HNu PI-101 photoionization detector or an OVA 128 flame ionization detector. At any time if sustained organic concentrations exceed 5 ppm above background levels in the workers' breathing zone during Level D activities, an upgrade to Level C will be warranted. If sustained volatile organic concentrations exceed 50 ppm above background levels in the workers' breathing zone for Level C activities, an upgrade to Level B will be warranted. Monitoring will also be performed using the MSA 361 O2/LEL/H2S meter during drilling activities. If concentrations detected exceed 25 percent of the LEL all work will stop and the site conditions re-evaluated. In addition, a background reading will be collected with each instrument. A background area is defined as an area free of site-generated airborne contaminants. This area will be located upwind of the work area. All instruments will be calibrated and operated in accordance with manufacturer's specifications.





3.0 DECONTAMINATION PROCEDURES

Personnel and equipment leaving the Exclusion Zone (work area) shall be thoroughly decontaminated. The minimum Level <u>C</u> decontamination protocol shall be used with the following decontamination stations:

- 1. Equipment drop
- 2. Glove wash
- 3. Glove rinse
- 4. Boot wash
- Boot rinse
- 6. Protective clothing removal
- 7. Respirator removal

NOTE: The above wash and rinse stations may be eliminated if a total disposable outfit is utilized: however, protective clothing removal shall be performed as stated above.

Clothing known to be contaminated should be contained and left onsite for proper disposal along with decontamination solutions. All equipment coming in contact with contaminated soil or groundwater must be properly decontaminated before leaving the site. See Attachment B for respirator sanitizing procedures.

The following decontamination equipment is required:

Tubs. buckets. brushes. liquinox. sprayer, and trash bags.

3.1 EOUIPMENT

Heavy equipment that comes in contact with contaminated materials must be cleaned by approved means before leaving the site. Heavy equipment decontamination shall be performed by the Contractor at the designated washdown station using approved means (water and/or steam). Level C personal protection will be used while decontaminating the equipment. Section 2.3 lists the dermal protection to be utilized for this task.





4.0 GENERAL WORK REQUIREMENTS

All BCM personnel must comply with the following requirements:

- 1. Satisfy the medical surveillance requirements as listed in 29 CFR Part 1910.120 Hazardous Waste Operations and Emergency Response, Final Rule
- 2. Receive appropriate safety training (29 CFR Part 1910.120)
- 3. Complete 3 days of prior fieldwork under a qualified supervisor
- 4. Review the HASP and are fully aware of the requirements in the plan
- 5. Dressed out in accordance with the task-specific plans
- 6. No eating, drinking, smoking, or gum or tobacco chewing is allowed in the work zone
- 7. Wash hands and face before leaving the work area. Individuals will shower, as soon as possible, after leaving the job site at the end of the day
- 8. Contact with contaminated surfaces or surfaces suspected of being contaminated should be avoided while the worker is unprotected. In the event that protective clothing is ripped or torn, work is to stop and the protective clothing removed and replaced as soon as possible. In the event of direct skin contact, the affected area is to be washed immediately with soap and water
- Any person under a physician's care, taking medication, or those who experience allergic reactions must inform the Health and Safety Officer

All personnel entering areas requiring Level B or C protection shall:

- Be respirator fit-tested (within previous 6 months). Documentation must be provided to show respirator size, model, and manufacturer.
- Be cleanly shaven
- 3. Have been trained in the level of respiratory protection being used at the site
- Work in a minimum of a two-person team with a line of sight to a third person (Level B)





4.1 CONTRACTOR

This provision imposes upon the contractor the responsibility for the health and safety of his employees and others while performing work on the site.

- The contractor shall satisfy all federal, state, and local statutes, regulations and ordinances regarding health and safety, including the most recent OSHA standards which are specifically referenced.
- Contractor shall review the HASP and attend a safety briefing given by BCM and sign the Approval/Sign Off format found in the back of the HASP prior to site entry.
- Contractors shall supply the necessary safety equipment (as outlined by this Health and Safety Plan [HASP]) for their crews. BCM is not responsible for contractor safety equipment.





5.0 SITE ENTRY AND EXIT PROCEDURES

Startup

- 1. Team briefing to review intended daily operations and safety procedure update
- 2. Daily check of all monitoring and safety equipment
- 3. Personnel dress out and team proceeds to the work area

Shutdown

- 1. All personnel exit from the work zone and decontaminate
- 2. Ensure that the work area and all equipment are secured





6.0 VISITOR PROTOCOL

All visitors who proceed downrange in the Work Area must comply with the following requirements and those set forth in Section 4.0.

- 1. Visitors must have reviewed the site-specific HASP and must agree to comply with the guidelines set forth in this plan
- 2. Visitors will be limited to Level D work areas
- 3. Visitors must be escorted by onsite personnel





7.0 HEAT EXPOSURE

7.1 HEAT STRESS

Heat stress is a major hazard, especially for workers wearing protective clothing. Depending on the ambient conditions and the work being performed, heat stress can occur very rapidly — within as little as 15 minutes. The key to preventing excessive heat stress is educating personnel on the hazards associated with working in heat and the benefits of implementing proper controls and work practices.

7.1.1 Heat Rash

Heat rash (prickly heat) may result from continuous exposure to heat or humid air where the skin remains wet due to lack of evaporation, sweat ducts become plugged, and a skin rash appears. This uncomfortable rash can be prevented by resting in a cool place during breaks and by good daily personal hygiene.

7.1.2 Heat Cramps

Heat cramps are muscular spasms, usually in abdomen or limbs due to loss of salt following profuse sweating. The drinking of large quantities of water tends to dilute the body's fluids, while the body continues to lose salt.

First Aid:

- 1. Apply warm moist heat and pressure to reduce pain
- 2. Give electrolyte drinks by mouth

7.1.3 Heat Exhaustion

<u>Caution</u>: Persons with heart problems or on a "low sodium" diet who work in hot environments should consult a physician about what to do under these conditions.

Heat exhaustion is a result of overexertion in hot or warm weather. It is highly possible for an onsite worker to experience heat exhaustion due to the use of worker protective coveralls, boots, gloves, and respiratory protection, even if ambient temperatures are mild.





Symptoms:

- 1. Pale, clammy skin
- 2. Profuse perspiration
- Weakness
- 4. Headache
- 5. Nausea

First Aid:

- 1. Get victim into shade or cooler place
- 2. Immediately remove any protective clothing
- 3. Victim should drink plenty of fluids
- 4. Victim should lie down with feet raised
- 5. Fan and cool victim with wet compresses
- 6. If vomiting occurs, transport to hospital
- 7. Victim should rest for a few days

Prevention:

- 1. If possible, schedule work for early morning or evening during warm weather
- 2. Work in shifts; limit downrange time of personnel and follow with frequent breaks
- 3. Have cool liquids at Exclusion Zone border for downrange personnel to continuously replace body fluids
- 4. The HSO or designee should continually monitor personnel for signs of heat stress

7.1.4 Heat Stroke

The body's temperature control system that causes sweating stops functioning correctly in the case of heat stroke. Brain damage and death may occur if body core temperature is extremely elevated and is not reduced.





Symptoms:

- 1. Flushed, hot dry skin
- 2. High body core temperature (≥105°F)
- 3. Dizziness
- 4. Nausea
- 5. Headache
- 6. Rapid pulse
- 7. Unconsciousness

First Aid:

Immediately take precautions to cool body core temperature by removing clothing and sponging body with alcohol, or cool water, or placing in tub of cold water until temperature is lowered sufficiently (102°F). Stop cooling and observe victim for 10 minutes. Once temperature remains lowered, dry person off. Use fans or air conditioning, if available. Do not give the victim stimulants. Transfer to medical facility.





8.0 DRILLING SAFETY

The drilling contractor is required to comply with all local, state, and federal regulations regarding the safe operation of a drill rig. The following items serve as guidelines for drilling operations.

- 1. Prior to drilling, adequate site clearing and leveling should be performed to accommodate the drill rig and supplies and provide a safe working area.
- 2. Overhead and buried utilities must be located prior to start-up of drilling activities.
- 3. All onsite personnel should stand clear of the drill rig immediately prior to and during starting of the engine.
- 4. Organic vapor monitoring will be conducted continuously in the workers breathing zone during drilling operations.
- 5. If Level B (Airline respirators) is utilized, particular attention should be given to the airline hose in order to ensure that workers do not trip on the hose and that the hose does not become entangled or severed from moving parts.
- 6. Immediately following the completion of drilling operations, the entire work area will be monitored to determine if vapor concentrations have returned to background levels. If elevated levels are detected, the source will be determined and the appropriate action will be taken.





9.0 EMERGENCY CONTINGENCY PLAN

If an incident occurs that requires declaring an emergency, all personnel will assemble at the decontamination station for further instruction. Arrangement for decontamination, evacuation, and/or transport will be made at that time. The client and the appropriate BCM personnel will be notified of the incident as soon as is practicable.

9.1 NOTIFICATION/REPORTING PROCEDURES

In the event of an emergency, <u>Russell Levering</u> will be notified as soon as possible as to the nature of the incident (vapor release, injury, etc.), and emergency services will be notified as needed (see Section 9.6 - Contingency Contacts).

9.2 UNEXPECTED VAPOR RELEASES

In the event that airborne contaminants migrate from the work zone and potentially endanger unprotected personnel or the community, all onsite activities will cease until the release is brought under control.

9.3 PERSONNEL INJURY

In the event of an injury, all personnel will assemble at the decontamination station. If the injured person is immobile, one or more persons should remain nearby to provide any necessary first aid. If medical help is needed, the Project Geologist will summon the appropriate assistance as outlined below, or transport as necessary. The extent of decontamination of any injured personnel, and those coming to his or her aid, is a judgement that must be made on a case-by-case basis.

While onsite activity is in progress, it is recommended that at least one qualified person will be available at all times to administer first aid, including CPR.

If an eye or skin injury is chemical in nature (e.g., overexposure), the following first aid procedures are to be instituted:

- Eve Exposure If contaminated solids or liquids gets into the eyes, wash eyes immediately for 15 minutes at the emergency eye wash station (Contamination Reduction Zone) using large amounts of water and occasionally lifting the lower and upper eye lids. Obtain medical attention immediately.
- Skin Exposure If contaminated solid or liquid gets on the skin, promptly wash the contaminated skin using soap or mild detergent and water. If solids or liquids penetrate the clothing, remove the clothing immediately and wash the skin using soap or mild detergent and water. Obtain medical attention immediately.





9.4 EVACUATION PLAN

In the event of an onsite evacuation, the following plan will be put into effect:

- A signal consisting of five 1-second blasts of vehicle or air horn will be used.
- All personnel will immediately evacuate downwind areas and report to the decontamination station for further instruction.

9.5 SPILL PREVENTION AND RESPONSE

In the event of a leak or a spill, the area will be cordoned off and the spill contained and cleaned up by authorized personnel. All materials will be disposed of in a proper manner.





9.6 CONTINGENCY CONTACTS

Agency	Contact	Phone Number
Fire Department	Paoli Fire Department	(215) 644-1224
Police Department	Paoli Area Police Dept.	(215) 647-1440
Health Department	Health Department	(215) 344-6160
Poison Control Center	Poison Control	(215) 386-2100
Hospital Emergency Room	Paoli	(215) 648-1043
Ambulance	Paoli Fire Department	(215) 953-0800
State Agency Hotline	PADER	(215) 270-1900
Drilling Contractor	C.S. Garber & Sons, Inc.~ Dennis Stoudt	(215) 367-2861
State Police	West Chester Barracks	(215) 692-2290
Onsite Coordinator	Edward Grieff	Onsite
Primary Plant Contact	Russell Levering	(215) 647-3450
Secondary Plant Contact	George Meyer	(215) 647-3450
BCM Contact	(b) (4)	(215) 825-3800

Directions to Hospital (Emergency Route)

Paoli Hospital

Depart facility turning onto Route 30 east. Follow Route 30 East approximately 2 to 3 miles. Paoli Hospital is located on the left hand side of Route 30.





ATTACHMENT A





ATTACHMENT A

MSA ULTRATWIN INSPECTION CHECKLIST PRIOR TO FIELD USE

- 1. Exhalation Valve pull off plastic cover and check valve for debris or for tears in the neoprene valve (which could cause leakage).
- 2. Inhalation Valves (two) screw off cartridges and visually inspect neoprene valves for tears. Make sure that the inhalation valves and cartridge receptacle gaskets are in place.
- 3. Make sure a protective cover lens is attached to the lens.
- 4. Make sure you have the right cartridge.
- 5. Make sure that the facepiece harness is not damaged. The serrated portion of the harness can fragment which will prevent proper face seal adjustment.
- 6. Make sure the speaking diaphragm retainer ring is hand tight.
- 7. Don the respirator and perform a negative pressure test.

POSITIVE/NEGATIVE FIT TEST PROCEDURES

The respirator must be subjected to the following tightness test before each use:

Test respirator for leakage using a positive pressure method. Lightly place palm over exhalation valve cover. Gently exhale. A slight positive pressure should build up inside the respirator. If any leakage is detected around the facial seal, readjust head harness straps and repeat test until there is no leakage. If other facial seal leakage is detected, the condition must be investigated and corrected before another test is made. A negative pressure test may also be performed on certain types of respirators. Lightly place palms over cartridges or filter holders. Gently inhale and the facepiece should collapse against the face. The respirator must pass the tightness tests before the respirator is used. The respirator will not furnish protection unless all inhaled air is drawn through suitable cartridges or filters.



ATTACHMENT B

.





ATTACHMENT B

PROCEDURE FOR CLEANING AND DISINFECTING RESPIRATORS

- 1. Remove cartridges (if of the air-purifying type) and put in container provided.
- 2. Remove regulator of airline respirator.
- 3. Remove any gross contamination with water and paper towels, taking care not to scratch the plastic lens.
- 4. Mix 70 ml of concentrated cleaning solution into 3 gallons of water in the bucket provided.
- 5. Soak respirator in solution for about 10 minutes (remove regulator if airline respirator).
- 6. Dip respirator into rinse bucket several times.
- 7. Rinse respirator with copious amounts of fresh water from the eye wash station.
- Shake excess water from respirator, dry with paper towels, ensure that exhalation valve is clean, dry, and operable, and place into new plastic bag.





HEALTH AND SAFETY PLAN APPROVAL/SIGN-OFF FORMAT

I have read, understood, and agree with information set forth in this Health and Safety Plan and discussed in the Personnel Health and Safety

	Health	and	Safety	Plan	and	alscussed	חום	the	Personne	Health	and	Sarety
(b)	hriefi <mark>(4)</mark>	na .							Personne		8-	48 9
												, ,
											-4~f	9
											Dat	e
										٠,	4-8	9
											Dat	
										3	-1-	
												e T
											%/// Dat	89
										. 7		
										8	Dat	<u>/89</u>
											Dat	e
												0/89
											Dat	e
												<u></u>
											Dat	:e
											Dat	:e
											Dat	: e





APPENDIX C FIELD DATA SHEETS

18 192.

betz converse herpoch inc groundhater sapeling field data sheft of \mathcal{V}

Client CHRISTIANA METALS
Location FRAZUL Pa.

Contact Person

Reason for Sampling 1st 100 mg

Weather Quente 451 80 k

Phone Ho.

Note 8-39-89

							£
Well	Tield-Recovery	RAILER CLEAR.	AND-NIP TAN CLUMES CLUMES	CONTRACTOR	HWO-WIE DARK BROWN SILTY BAIL DRY 32	HANU - 20 PPA BROWN SICTY BUILDRY BY < 35.40	CLEARS CLEARS CUMPLED DEX SX CASPON
Samp) (ng	Method	l			•		
3	Time	oh:11	5/12	02/	950	155	3:25
	Temp.	Series oh:11 7,8	5161 2.81	19°C	7,6 1320	17% 155	18°C 3:35
Graynda ter	Cond.	95	spd	4600 192 120	710	5.83 250	<i>08</i> %
į	ā	5,13	25	CK.	6.58	5.83	7.54
te	Hethod	Moneute Pump	>	Put Banue	puc Barcole I		Hamerit
Evacuate	Volume Hethod	75grby 100menter 5.93 95	držep	16 yala	10 galo	15 gh	#0. galy
	Volume	24 guto	6.5gb 45gb	5.5 gals 16 qual Banue (50)	350 10 gale Baywor 6.58 710	sph	18.75 Maly Hamerit 7.34 380
Ye)	Diameter	ל",	3	411	44	1/1	4"
	Depth	.84	20,	20,	20.5	30'	37,
Depth to GH	w/reference	13.25'	15.01 10.01		16.22° TO PVC	12.62' TO PUC	10.32' TO PVE
	¥e.≥	34 -	35	3/2	30	3 ~	3 8



py duf 2

BETZ CONVERSE MIRNOCH THE GROUNDWATER SAUPLING FIELD DATA SHEFT

CTIENT CHRISTIANA METALS	DAYQ	Nate 8-29-87
Location FRAZOR, Pa.		Project No.
Contact Person	Phone Ho.	
Sampling Team (b) (4)		Weather OUCALAST 80'S
Reason for Sampling 18T YOUND		

		Depth to GW	·	Vell		Evacu	ate	6	iroyndu ter		Sa.	mpling	We11
	Well	w/reference	Depth	Diameter	Volume	Volume	Rethod	pH	Cond.	Temp.	Time	Methnd	Tield-Recovery
¥	MW 14A	9.12" TO PUC	17'	4"	5.5 gats	16glo	PVC BAILUR	6.95	430	18°e	\$3.00		BROWN SILTY AND S . S PPT BAIL DRY 3X
	MW 15	ACTECIAU	78'	4"	55 galo	1		17·13	610	18%	3:30		TAN CLUMES SILTY HOU- 9 ppm
	MW 16	7.18' TO PUL	21	4".	9.75 de	30gets	PVC BAILUR	7.18	380	180	4:30		TAN GILTY HNU - SPAM
				3									g,
			,	,									

* DUPLICATE TAKEN AT MW-14A, LABELLED MW-14B



GROUNDWATER SAMPLING FIELD DATA SHEFT

Citene Christiana Metals Location Malvern la:		8/36/89 et Mo. 6471-61
Contact Person	Phone Ho.	
Sampling Team (D) (4)	Weather Partly	Cloudy 8015 - to Surny
Reason for Sampling		,

	He]]	Depth to GW w/reference	Depth	Well Diameter	Yolune	Yolume You	Hethod	PH C	Cond.	Temp.	Time Sa	npling Hethod	Well Yield-Recovery	
	W 9	15.45 T.o.5.	63	6"		215 gallons	Hombie Pump	6.98	450	212	13:10	Teslon Bailer	Orangish 15 spm	on t
nkig ga ne meli vba ov	0	13.13 16 PVC	20'	4"	4.3 los	14 gallons	quc Bailer	6.91	440	23°C			Greenish Muddy 19pm - poorynol	
*	Mω	8.63 TO PUC	21'	4".	8.6 gallous	gallous	PVC Bailer	6.95	500	al'c	14:40		Brown Muddy poor yield	16.
*	MW	9.01 TO PVC	16'	4"	4,8 gallous	15 gallons	PVC Bailes	6.98	(5°)	21°C	15:30		Brown Poor yield	MO CO
1.	м ^ω 3	6.10 TO PVC	14	۲" .	5.5 gailons	17 gNh	PVC Bailer	7.14	48	al°C	16:15		Clear to muddy fair yield	10 (c)
	MW 2	6.35 TO PVC	21'	4"	10.a gallons	31 gallous	Homelite pump	6.38	500	22°C	16:00	Tellon Bailer	Clear 19pm	0-2. H-141



HAU was picking up whatever they were welding inside building. We could smell it.

MW-12/ON 0-20 scale the H-Nu was reading the air around us at 3, when put in well needle went to 4.

MW-11 - on 0-20 scale the H-Mu was reading 2, When well was opened readle jumped to 1) then which down and held between 7+5. Purge water



BETZ CONVERSE MIRROCH INC GROUNDWATER SAMPLING FIELD DATA SHEET

Client	Christiana	Metals	_		Date 8	30/89	_
Location	Malvern Pa				Project Ko.	64721.01	_
Contact Person	42.42		Phone Ha.				
Sampling Team	(b) (4)	 		Weather Darth	y Cloudy	80.3. 40 Sun	24
Reason for Sam	ant for						•

Well	Depth to GW w/reference	Depth	Well Diameter	Volume	Evacu Volume	ete Hethod	PH	rounder ter	Temp.	Time	mp]ing Hethod	TTETA	Hell -Recovery	
60 WM	2.52 TOPK	15'	4"	8.7 gallous	110 gallows	Homelike Pump	1.01	410	20°C	16:30	Teflor Bailer	muckly	boclear gpm	hadi burda vo uso obsusc
													<i>A</i>	readi
														12
			1				<u> </u>							
												i		
														1

8.736



BETT. CONVERSE MURROCH INC GROUNDWATER SAMPLING FIELD DATA SHEFT

Client CHRISTIANA METALS			Nate9-	28-89
Location PRAZITE Par			Project No.	6471-01
Contact Person	Phone No.			
Sampling Team (b) (4)		Heather SUNNY	<u>70ර</u> ු	
Reason for Sampling 200 POWA				

Well	Depth to GW w/reference	Depth	Nell Diameter	Yolume	Evacu VoTume	ate Hethod	pH 6	round ter	Temp.	Sa Time	mp]Ing Hethod	Well Yfeld-Recovery
MW 13	13.29' TO PVC	37'	qu	16.60	50gs	KUCK PUMP				1230	DUDICATED TEFCUID BAILUR	BROWN SILTY FAIR YNED
14 14		17'	γ".	6 gulo	15 cycler	PUC BAILLIPE				1240		CHAR W/ A TAN TIAT PUMPLUTEY 3X
MW 15	ARTESIAN TO PVC	78'	4"	55 guls	110ges	Tauaka Pump				1350		CLEAR 415pm
MW 16	5.551 To PUC	21'	44	10.8cm	عاسودة	reck Rump				1345		TAN, TURBID CLUMES SOME ~1.5COM
MW 10A	2.79' 10 PVC	15'	4"	8.5GNr					·	1492		TIN COLOR CLUAR 2/5CPM
18 mw	10.11'	21'	ų"	7.6galo	23406	PUMP				Ø6W		TAN TURBID CLEARS SOME ~1.55pm

- DUPLICATED TAKEN AT MW-10A, LABUCLED MW-10B
- FILLD BLANK TAKENBUT-URE MW-15 WAS SAMPLED



BETZ CONVERSE MURDOCH INC GROUNDWATER SAMPLING FIELD DATA SHEET

Client CHRISTIANA MATRIS		Nata 9/28/69
Location FRAZER PA-		Project No. (647/-01
Contact Person	Phone No.	
Sampling Team (D) (4)		Weather SUNNY 70'S
Reason for Sampling 10000		

Well	Depth to GW w/reference	Depth	Hell Diameter	Volume	Evacu Volume	ate Hethod	हम स	roundester Cond.	Temp.	Sa Y1me	mp]1 mg Hethod	Well Yield-Recovery
mW 11	8.64'	16'	4"	5.24gb	18gole	PIC BAILUR	,			1/35	1124-104	BROWN TURBID
S MW	7.77' 10 PVC	<i>31'</i>	411	9.2gas	Haplo	TANAKA PUNP				1520		TAN TURBUD CLUMRE SOME ~1 SPA
mw 3	7.51' 10 PVC	14' .	4"	4.5gH6	14cpto	Baiun				1540		BLOWN TURBID BAILS DRY
											·	







APPENDIX D CHAIN-OF-CUSTODY DOCUMENTATION

BOV	1				(Chain o	F CUST	ODY	/ RE	COI	ab.		(OF	RDE	RN	IUMBER		
PROJ N 64 7 I y SAMPLER	7	PROJ			ME Bros	NO. OF CON-		Š	<u></u>	/	/	[]								u ić	KEY AQ-Aqueous S-Solid A-Air L-Liquid O-Other	
BCM NUMBER Lab Only)		TIME	COMP	GRAB	STATION LOCATION	TAIN- ERS	1	\ <u>\\</u>									<u>v</u> /	AN	FIE I <u>AL</u>	LD YSES	REMARKS/ ANALYSES	1
	,				Empties wines on	2 21 c	14	12.1	.01		1.23	1177	20)	ne.	170	,]-,	1981	eth.	VOCs 6	
	1314	5/6	•	X	Trip Blints.	1,1 -	Ç								1		ÜŢ	1.	515	्ति इ	method &	<u>.</u>
	1347	14		×	La 18 1 and Water Rose Part		4		11: 1	·	<u>*</u>	1783	1411	1)a	9.9	٠.		;	- 1	ois, (C)		
	14	1405		X	MN-64-45	and a	1		मिन जुल	, 1 1 :	13	7 7	qq.	00) 10	();:					79 175	111	
	5/h.	H30		¥	B-5-1,5		,						*	s.ifs	្រ	77	'			1, 111	304 L 1999	
	1/60	1445	1	7	8-5-3,5 or to all tem	1	1														,	
		145C		7	B-5-4,5	11 i.j	1								÷		11				**	
	1/2	1500		Y	B-5-6.5	1	1	L	L	74	177	ai -	юŀ	tt:	Hr.		<i>•</i> ' ;	· ·	. :	**11*	4	
	Zh	1552	<u> </u>	*	8-6-15	1/	1				31.		dw.	,	.7 10.	÷		ŧ			#1	
	1/4		<u> </u>	×	8-6-5,5	/	1	<u> </u>			L	L	ź	11	10			• •	i.	British)	as something	
	1/4	1405	_	×	Field Blank	_/	Z	<u> </u>	11.	<u> </u>	٠.	1.1	ηı	ł			_	:		1, 41	. 4	
	23/19	<u></u>	<u> </u>	x	Trip Blank	/	L	_	L	_		Ш	1+	: 1 :		,			•	A 1	is.	
	:•	<u> </u>			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ļ	L	L	(G)	,.	i:	€ [3]	٠,	,	dan.		;	•	·	,: 4		_
		<u> </u>	_	$oxed{oxed}$	programme and the first transfer of the firs	rat		<u> </u>	<u> </u>	<u>.</u>	7,1	ـناــ	i),	- :	خنت		_		111		, r:	
	ļ		_		The state of the s		<u> </u>		<u> </u>	<u> </u>		_			_		_				* •	_
		ļ	<u> </u>	_	A STATE OF THE STA		<u> </u>	↓_	<u> </u>	Ľ	э.	1(12)	++ Z	1	135		1		_ '	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	· • • • • • • • • • • • • • • • • • • •	_
		ļ <u>.</u>	 	-	A STATE OF THE PROPERTY OF THE		_	ļ								_	_		_	<u>'</u>		_
***NOTE	ANY KM	OWN OF	Щ,			<u> </u>		- 1"		Ļ	Ļ	įει	3 1	- 17.			_		i:)		14	_
SUSPEC	TED HA	ZAROS		*	All samples contin	Mugh		JPO							<u>rc</u>						d by: (SIGNATU	
7				5	10:50	CS.		my	a r 0 17	JU E		(v(l)								in Ci		1E/
					Date/Time Received for (SIGNA Laboratory by	. 7	1/	Dai	ie/T	ime Vic	io ioi P	(Sh Air	ippi bili	ng/i Nun	ber	ر ال	্বাছ 📑	F.O.C	117	kg hadi Latetes Latetes		
stributio				b fil	e; Yellow to Project Manager; Gold to be retained by Sampler in			ST(7

BOV	1				CHAIN OF	CUST	ODY	RE	COI	3D		(0	RDE	R N	UMBER	
PROJ N 64	ю.	PROJ	ECT	NA		NO.				7									75	MOST	AQ-Aqueous S-Solid
4)						OF CON- TAIN-		Je Je	> /			υZ	i de	1	-9/					LIA	A-Air L-Liquid O-Other
BCM IUMBER ab Only)		TIME	COMP	GRAB	STATION LOCATION To the	ERS	/	2					/			/		_Δ	FIE	YSES	REMARKS/ ANALYSES
		1820		X	Trip Blon Kironton Could	37	Χ	Dire	6h	o je	Sic	3 <u>1</u> 9	39.	Ju:	pn	lot	438	Eir	.c/	ខណ្ឌ មន្ត្រា	.F
		1620	- 1	X	ta Field Blan Action Printer VI	107	X								, S	∫i:	1gr	ISI	i se	स्थित 🖅	ारमा सम्माने १००७
	24.40	3 mile	1"		15. Percyle-Greek Entre			,	di d	n_{\bullet}		អាម					1	भाषाः	ij,	(1919)	4.
	11.	7.1		2-54	ार्क त्रांक राज्या का स्थानकार प्राप्त कराती है। es bliered for tack of the	ort.		716- 91	•			iai	73:	10 egt	्राह्य रेक्षान	,	10 5 (1)	1 7 1 1 1		i di Berinina	on terrantoni
						. **									a n		11	Эľ:	44		
	 	1			ry indicate a set of the second between the second second between the second second second between the second seco	tini								-							
	6.4.3	T r 1 74		5.7	LOS, employ with cutto (179) on the employed and along the left.								-		Į,		Д				···
			 '''	<u> </u>	The restrict to the analysis	.100):(C.	iDi-	pi.	vale	716:	Hr.		.,		21	tq and	
	; ; ;	1513	-		TOTAL MEGGAM MARK				-						,,,,		_				
		 			yadisoodi jis ee	3441		<u>`</u>	e.h	3157	11 61	ыв	11231 11	11:	F C	Jie Je	1	1) Te	are.		your many top.
		<u> </u>	\vdash	-					. 2.1		1.5	10	Ť		-	-	-		-		` ` ` · · ·
		L.	 	j#7	45 9 - artigadisLtA			<u> </u>	5331.	4.3.	i D.	:1i			or or		45°	83 93		ar i	
		-	┢	H					toc'		j61	1.45	by :	_	16.	j.	ь. 16.	-	-		
:	·	3615 1	 	14.1	17. ECM i angle combre positional "Rom describeto," etc.	-vdt	_		· · ·	105			_				-	-			
		-	\vdash		· · · · · · · · · · · · · · · · · · ·			291) <u>(</u>	-	1/4.		બાહ	· 64		10			()	063v	
	1			2.8	year tempology and common service				├-	_	\vdash	\vdash					\vdash	1.42			
<u> ::</u>	1.77		\vdash	-	saring a bound of the design of the most said to		<u> </u>	_	' 3-	150	ыW	100	ามา	911	93.	**************************************		- 17		Padici S Great	
		 	 	-	The state of the state of the testing of the state of the	1987.5			_		Щ										1
···NOTE	ANY EM	Olay on	<u></u>	<u> </u>	्यत्राप्ति हार्यः कल्यं स्था स्थ		<u>L_</u>	3.4%		31.	117	, in				1. 1	137 1317,	92 . ·	L''-	or the contra	11
SUSPEC	TED HA	ZARDS	· · · · · ·		as	!1	10-1	l	i.L	-46											d has countries
							 nei	uiqu	H 3 F)	au C											ed by: (SIGNATURE
							\vdash	Det	ĕ/T	lme	()	(S)	اذخا	no/	Rén	اداة		Ro	ne.	ke as a	
							_ /			130	1 01	Áir	PIN (Nuit	أفظ	411	्रां	;::		ंनांक ः	n, hared कर्न हरू
o Aniib Aii -	A-1	alact 6			No Mattern de Duelock Manager			STO	┸						gar).	iter,	3 P 1	741	# 1 ·	ना इ.म	Strange of March
iTributio					le; Yellow to Project Manager; Gold to be retained by Sampler in fi	ield.		ACT													

....

·

BCM	Chain of Cus	STODY	RECO	RD	(ORDE	R NUMBER	
PROJ NO. 6471-07 Christiana Bret. (4) BCM NUMBER DATE TIME OF STA	NO. OF CON TAIN ERS								FIELD NALYSES	KEY AQ-Aqueous S-Solid A-Air L-Liquid O-Other REMARKS/ ANALYSES
	lies 2º			\leftarrow	$\left(\cdot \right)$	+	5	+		AMALIGES
8/6/1820 X T.	Blubs 2	 					5		7 13 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
	cl Blunk Mate, Russly 4			—		十	3			
	1-15	$\frac{1}{\sqrt{1}}$		 	- -	+	뒮	_		
	-9.5	×				- -	5			
32ky 0,05) B-7-	1,5	×					5			
1264 055 × B-7-	10,5	λ					5			
\$2k9 0555 X B-7-	U,5A /	X		16 ×	. ,	era, y	۶	th (*		
8/2 kg 0410 X B-7-		K		7/5			5			
3/4 0415 Y MM-12	- 1.5	X					5		•	* (•)
33840445 > MW-17	1-7,5	Х					٤	_ <u> </u> .	, est	
" 1/3/44 1020 X MW-12	1-15	X					12		· .	
3/4 1445 # B-9-1		×					15			
53441462 X B-9-		×					5	-		
1/3/84 min x B-9-		Х		$\sqcup \bot$		_	5	\bot		
\$369 1510 X B-9-	10.5	<u> </u>				,	5			
1/ky 1/520 x Trip!	Plank /	<u> </u>				\perp	Æ			
*** NOTE ANY KNOWN OR	Blunt 1	X	. !				AQ			
SUSPECTED HAZARDS	1	Dell'	ooulek	ad bus	SIGNATU)	Date	/Time	. Becelu	ed by: (SIGNATURE)
7(4)		l.a.	- idasii	ou by: (SICHAIU		Pall) Hills	Macaly	ru wy. (arana (UHE)
		8/3	Date/T	1330	(Shippi Airbili			ig) Re	marks	
Distribution: Original to Lab file; Yellow to Pink to Sampler; Gold to be	o Project Manager; retained by Sampler in field.			SEALS ,N,NA)						1

3CV	1				CHAIN O	F CUST	ODY	RE(COI	RD.	ι	On J	(Of	RDE	R N	UMBEF	l		
PROJ N 5544 - (<mark>4)</mark>	0. 03	PROJE	CT (MAI M		NO., OF CON-		/o		3/4		1 -		/ /	20/20/	/			7	• • • •	K	queous olid r quid	
BCM NUMBER ab Only)	DATE	TIME	COMP	GRAB	STATION LOCATION	TAIN- ERS	4			5/2 2		7				/ 3	₹ /	A	FIE	D (SES	A	MARKS	S
	0 77	1630	_	Х	MW-5	9	1	1	1	ı	1	2				AG					gum!	Drice H	اقتح
	1/2/54	1730		×	MW-7	9	2		-	2	1.	2				K				•	Samp	physical phy	130
	3/7 kg	Iκ∞		X	Field Blenk	5	2	1				7			• •	10							
-	X6/34	1400		X	Trip Blank	5	2	1				2		_	-	40			٠.		<u></u>		
	1713.4	1800		X	Lab QA/OX (MW-7)	9	4	3				2				13	3.			:			
	5/7kq	1530		X	MU-6-Figu Prod	1		_					7	_		<u> </u>					Visa	-514 y	1
						ļ															<u> </u>		
	<u> </u>								Ŀ	_			- 4		•		4				<u> </u>		
					e te de la companya d		ļ	Щ.	ين	ļ	٠,	<u> </u>	.,		_						<u> </u>		
	<u> </u>							_					i :		: .:		Ш		·	1 1 1	·		
	 				198113		_		33	٠ 4		100							-	,			
					138 1 3		ļ	<u> </u>	<u> </u>	<u> </u>			,	,		_			ļ		<u> </u>	·	
	<u> </u>				•		<u> </u>	\vdash	ंतन	f.,					10.4	\dashv	Н				├—		
				-				-	<u></u> -	<u> - </u>	-	25 t	711.	, ·	- 7	•			,	, :			
	<u> </u>	1,		\vdash		-	-		-	-	-	\vdash					\vdash			· · · ·	 		
	<u> </u>		·.	\vdash		\$47.5 	-			-	1945	111	⊖t.	(1	-			11.	· ·	. · • 1.	-	•	
<u> </u>			<u> </u>	\vdash			-		2.5				- · ·		<u> </u>				. ,	1	-		
***NOTE	ANY KNO	OWN OR	*	+40	e filterest plantic pint comple &	, MW-5	1 42	15 1	1	+		्टो .	3~4		₹v.	é	e he	दर		١ ،	IN Q	POTEN ON	56,
SUSPEC	TED HA	(AHDS	**	1 1	of the red when he went summile Co	ar MW-	(b	(4)		lese	d				Par Birthal A							and the more vertical	
					e; Yellow to/9foject Manager;		දු			me S S	10	(Shi Airi			lece iber	:	ng)	Rer	nar	CS ***			3

and the second control of the second control

3UV	!]				CHAIN O	F CUST	QDY	REC	OR	D		١.				QI	RDE	RN	UMBEF	l
PROJ N	0.	PROJE			ME Luna Malals	NO.			7	7	7	7,	7	7/	1/		$\overline{/}$,		KEY AQ-Aqueous S-Solid
MPLER	S.		<u> </u>			OF CON-			1	/,	/i								- 15	A-Air L-Liquid O-Other
BCM UMBER	DATE	TIME	COMP	GRAB	STATION LOCATION	TAIN- ERS	4	ניאל פי		/ 1	//	//	//	//		W/	AN	FIEI IAL	D (SES	REMARKS/ ANALYSES
				::	Smalles "	660	24		:		, ·	ห์ ∹′		r 25						
		1 /			المراجعة الم	<u> </u>	7						L		,				:	
	1.7			· I	Who but dd Vel ? Co.	٠	0		dro	_ _	!	•1 (1)	1 2		5					
	8/5/54			X	B-10-1.5	/	$ \mathcal{L} $		-			1	1:	_	S				<u> </u>	
	P/46 184	1330		X	B-10-6.5		1		\dashv	1	-		-	. ;.	2				5 10	. :
	*/ <u>13.54</u>		Ш	X	B-11-15		14		_		4	_	+	1	<u>}</u>	Щ	\square			<u>.</u>
	NA	150		×	B-11-65		14			\perp	_	4	1-	1						
	3/18/54	1730		X	B-12-45	/	1		-	-4	4		-		2		·		. 15, .	
3 200	57.74	1745		×	B-R-60	. /	1	- : -	-	- -	4	<u>. -</u>	1.	_	2	-:-				· · · · · · · · · · · · · · · · · · ·
•	1/8/5	1870		Х	Fiell Blank	1	1		\dashv		4	4	+	-	>	H		_	1 111	\$1\$ (1) (
	 						\vdash	-i	11.		1 - 1	+	+	-	+	-	·		. :	
		ļ	•	$\vdash \vdash$		 		Щ			-	-	+-	╁	╀┩	_	\vdash			ļ
	 	<u> </u>			<u> </u>		-		<u>^</u>	- }	<u>ා</u>	- -	+	- -	-				<u> </u>	
	 -			H		<u> </u>	\vdash	-		-+	+		╁	+						ļ
	 			\vdash		91	-	-	-+	+	+		╁	+					· ·	
		 		H	V (181	 			+	\dashv	+	+	+-	+	-			\vdash		
	 	 		H		 	\vdash	11	1		+		T	1.		 	\vdash	·		
** NOTE	ANY KNO	OWN OR	-	B-1	1 & B-12 sumples peu	Ged	0V	A	4	-	4	<u> </u>	P	سفره	-	70	E)	141	<u> </u>
2001 24												GNA1	URE)			ime		lecelve	ed by: (SIGNATU
							8/	Pate		140	: L 2	Ship Airbi				ng)	Ren	nari	CS !	
แสอนาสอ					e; renow to Project manager; Gold to be retained by Sampler in	fiold				EAL N,NA							•		high .	

BOM					CHAIN O	F CHQT	ODY	DF.	COI	3D			ζ.	Ş			Ω	RDE	RN	UMBER	l
PROJ NO.	(4)		'sTH	bn (-	PILITALS FRANCE FOR	NO. OF CON- TAIN-		<u> </u>		7		30/					//	150	/ 10	345,345 (\$30)	KEY AN AQ-Aqueous S-Solid A-Air L-Liquid O-Other
NUMBER D	ATE	TIME	COMP	GRAB	SINGO CONSTATION LOCATION	ERS	/3	3/	X	X	Ž		_		\angle	Ä	a.	Al #		YSES	REMARKS/ ANALYSES
%	וינירי	#-₩ P	101	X.	with the base of	\	J.	1	1	1	•			٠.		AΩ	5.	٤3	h)	95	18
	14	いい	H:ii	1"	ologia Welterical to teach (1)	يتر	3	1	1	1					·	\tilde{L}	4	35.	* []	500)7
18	1	elt 23 G	1:11	16,	वस्तुकार्यः - अस्तुकार्यभूकार्यः । व	15	3	1	1	1	·	.23	•		. (Ŀ	4	ت		NE UC	/9:
11		J b	-	L	NAME OF THE PROPERTY OF THE PR	5	3	1	1	1			2" 11 	or	eder Lyse	1		il	_	710	17 11 11 15
			جبوا		party of the state	5	3	1	1	1			_	ነንታ፡	3.5	1		, 14	HP	20	rys y re fiblioda
	10	(ntiv)	ni :	1 p	February Transport Comments of the Comment of the C	2	3	Ŀ	-	•			_				-	-4		.60	18
	1	ون ﴿	1.5	ļ.,	Mental (Alino Basineo Baro)	a	3	<u>-</u>	-	-	-	_	4		_!	: <u>::</u> :::	K.	90		120	12
जा ह	5111	3:00	1 37.	 	LUR AGABANANA	3	3	-	•	, a		•	<u>;</u> !.	71E	lls;	4	-	3		430	17
		3:30		+	mu-15 your	2	3	<u> </u>	4	-				+	. 74.	4		13.		GIO :	
		11:50	-	H	mw-16	3	2	Ŀ	_		$\vdash \vdash$		\dashv	ना	14	+	7.	17	99,76	370	} lo seed bas
	H	W30	mile	n	FIRED FLAM	2	Ś	-	-	_	\vdash		•		11 62 -		p.	a e	11	1	्र दावा व विश्वसम्
	<u> </u>		1	1	FEUR TATAIBIONET IT	-3	국	<u> </u>	·							1	-		_		
ti de in	gill s	ente	3° 8°	116	1907 * sampler/courier signs; *		-	H	_	<u> </u>	\vdash		١.	_	िद	F		1 11	74:	Hgiq 3	.8
			 	 		<u> </u>	┝	<u> </u>	<u> </u>	<u> </u>	├╌┤	<u> </u>			<u>tr</u> /	10.	\vdash	.) P.	_	tyrum.	S, self (A, ring)
- 19: E	<u> 90 III</u>	v ไทยv	i gor	200	THE STANDARD RESIDENCE OF THE STANDARD RESID		-	_	-	<u> </u>	$\vdash \vdash$						 	<u> </u>	 		· · · · · · · · · · · · · · · · · · ·
1 10; 1	<u>e for</u>	nolino Maroe	1 32 V	bi	end to Alter the first day of mu	<u> </u>	-		-	\vdash	$\vdash \vdash$:		•	Ç	* ;	\vdash	' ejf		स्तीहारी ज्यानाळ	Of State Control
· · · · · · · · · ·	ببرة		+	-	drum rebre owne add and		\vdash	-	-	_	$\vdash \vdash$			_	. ;			\vdash	-	5 mpt-	
***NOTE AN	Y.KNC	WN OF	Pelipe	<u> 1</u>	Professor are snipped to lab	<u>. </u>	L.		L	Li	L_l			-			<u> </u>	L	L	F.31	l
) (4)	u HA.	LAKUS	oit ac	11	bar atrib men taga recipios		Rel	inqu	ish	ed b	y: (S	SIGN	ATUI	RE)	•	Dat		ime ,/-			d by: (SIGNATURE)
							1	Bat	.	710	2				Rec		ing)	Rer	nar	kser I e t A e ete A a e e	
Distribution:					ile; Yellow to Project Manager; Gold to be retained by Sampler in t	lield.		STO													

PHOJ N 6471-			PROJ			ME (Ligna Metals	NO.				3/2	*/s							/	/		KEY AQ-Aqued S-Solid	ous
(4)			,,,,,,,		Į		OF CON- TAIN-		/2	w.			* /					_			at gr	A-Air L-Liquid O-Other	l
BCM IUMBER #6 Only)				COMP	GRAB	STATION LOCATION	ERS	/	N. A.	\$							Ž.	4 /	A	A	LD YSES	REMA ANAL	
	/2	184	1600	-	X		2	2									X		٠.				
	1		1615	I	X	Mw- 3	2	2								-	6		,				
			1340		×		5	2		1				\int		,	6					,	
			1340		×		5	2		1							3						
			1310		×		5	a	Ī	1						1	Š			, .		i	
			1630		X		2	2								•	æ						
			1550	I	×		2	2								•	40	,					
	īb	Jz9	1440		X		2	2									0				i		
	šb	6		_	-	Triz Blank	2	2									A.A.						
7	-	,	1340	-	-	Field Blank	2	2								17.	€	÷.	ψß	97.5	6 6		1 1
	<u>.</u>					-			<u> </u>								-						
		1		<u> </u>					<u> </u>									વ	lic	1; ·	.ni 🐪	54. Y 1	
								<u> </u>		<u>. </u>								Ħ.		.1		:	
																						ļ	
	_			L.					L_										-1.	. •			
					1	-			_	L					ن	p	;• •		ijι).		2.60	:1	
					L										\bot						12 17		
<u> </u>		2055			L				L_							*	, ,		50.	13		<u> </u>	
SUSPEC	IED TED	HAZ	WN OR ZARDS													• • •	·		171				
1)								Hel	inqu	ish	ed b	y: (S	IGNA	TUR								ed by: (SIG	
								4	Dat		ime /2;	- 1	Shi _l Airb					ng)	Re	mar	ks		·]
stributio	n: Ó	Orig	inal to	La	b fil	e; Yellow to Project Manager; Gold to be retained by Sampler in (SEA ',N,N												

.

en se se constitue de la const

<u> </u>	<u> </u>	1 18 (1)				N OF CUST	ODY	RE	COF	ND.						OF	DEF	NU	MBER	
ROJ N 74 - G MPLER			11,	زن	ME ANTENA MITTERS	NO. OF CON- TAIN-		/;		7										KEY AQ-Aqueous S-Solid A-Air L-Liquid O-Other
SCM IMBER 5 Only)	DATE	TIME	COMP	GRAB	한 사람이 LOCATION	ERS	/				//	//	/			<u>"</u>	AN	ALY:	SES	REMARKS/ ANALYSES
	11:7.				Time I		.1													
	, r.			L	Ambrice William		4	_	Ш	\Box	\bot	_				\bot	4	_		
	7.112.40		,	;. ,	TRIP MARK		-					_				4		\perp		
	a ditor			<u> </u>	Circles Indian		<u> </u>					<u> </u>	<u> </u>				\perp	4		
			<u> </u>				L	_				_	_				_			
	12/14	1:20		X	n.m. 3	,	12	_			_ _	_			16	_	_	4		
	-	1-90		1	14W-3 44		-32	L			_ _	ļ	_		1	\dashv	_	\perp		
	1	<i>1432</i>	ļ	Ш	NW-101	3	3	Ŀ			_		_		1	4	_	4		
		W.	<u> </u>	\coprod	nw-11		.5	_			_ _		_		4	4		\perp		
		يرين ر	1_	\coprod	mw-12		12					_	_		11	4	_	4		
		1230	<u> </u>	Ш	mw-13		.3	ļ				<u> </u>	<u> </u>		Ш	_	_	\bot		·
	-	134 U	┞	11	niv-14		2	_				\vdash	┡			4		-		
	1	1300	<u> </u>	₩	mlv 1	<u> </u>	2	<u> </u>	\vdash			+-			\Box	4	_	4		
		20-	├		1.100-16			_	-		_	-				-		+		
		11/33		H	mw-10?		3	-		\parallel		+	\vdash		11	\dashv	-	4	-	
	-	147	 	1	FILE DE PLANTE		1	_				ـ		_		4		4		
	1		 	-	PRIPLANE	- '	12	_	 		- ∤-	 	_		4	+	-	\dashv	<u>.</u>	
* NOTE	WY KM	WW OR		<u> </u>	L Two sets		L_	<u> </u>	<u> </u>		L_		<u> </u>					L		
SUSPEC	TED HA	ZAROS	· 				Rel	ino	deh	ed be	y: (SIG	NATT	IRFI	Γ	Date	/TL	me	TR4	caive	d by: (SIGNATUI
											, . ,									ارد در. ازد دره
								Dal	e/Ti	me	(S	hlpp	ina/	Rec	olvin	(p)	Rem	arks	<u> </u>	
							1/2	r/.	1	•	, Ai	rbili				.			_	
ribti-	o. O-1-	doet to		h 41	le; Yellow to Project Manager;		CH	STO	10V	SEA										4

Pink to Sampler; Gold to be retained by Sampler in field. [INTACT (YIN, NA)]





APPENDIX E LABORATORY ANALYTICAL DATA SHEETS



1850 Gravers Road Norristown, PA 19401

(215) 275-0281

FINAL REPORT This is a final report.

The results have been checked and authorized for release.

PLEASE REMIT CHECKS TO: BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 1942 215-825-3800

PAGE

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Order# :

Date

BCM #

08/29/89 00-6471-01

P.O.#

29200

BCM Number : 923863

Location

Client ID :

: MV-10A-1.5

Date Sampled :

08/01/89

Date Received : 08/01/89

Sampler

: **E**S

Test Description	Results	Units	Test Method
Purgeable Halocarbons by (b) (4) on 08/03/8	9		EPA # 8010
1,2-Dichloropenzene	< 0.0114	mg/kg	EFR # UUIV
1.3-Dichlorobenzene	< 0.0114	mg/kg	
1,4-Dichlorobenzene	< 0.0114	mg/kg	
Bromoform	< 0.0114	mg/kg	
Carbon Tetrachloride	< 0.0114	mg/kg	
Chlorobenzene	< 0.0114	mg/kg	7 (7 = 7 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
Dibromochloromethane	₹ 0.0114	mg/kg	
Bromodichloromethane	< 0.0114	mg/kg	
Chloroethane	< 0.0114	mg/kg	
Chloroform	< 0.0114	mg/kg	
1,1-Dichloroethane	< 0.0114	mg/kg	
1,2-Dichloroethane	< 0.0114	mg/kg	
1,1-Dichlorosthene	< 0.0114	mg/kg	
1,2-Dichloropropane	< 0.0114	mg/kg	
Cis-1,3-Dichloropropene	< 0.0114	mg/kg	
Trans-1,3-Dichloropropene	< 0.0114	mg/kg	
Bromomethane (Methyl Bromide)	< 0.0114	mg/kg	
Chloromethane (Methyl Chloride)	< 0.0114	mg/kg	
Methylene Chloride	< 0.0114	mg/kg	
1,1,2,2-Tetrachloroethane	< 0.0114	mg/kg	
Tetrachloroethene (PCE)	< 0.0114	mg/kg	
Trans-1,2-Dichlorosthens	< 0.0114	mg/Kg	•
1,1,1-Trichlorosthans	< 0.0114	mg/kg	
1,1,2-Trichloroethane	< 0.0114	mg/kg	
Trichloroethene (TCE)	< 0.0114	mg/kg	
Trichlorofluoromethane	< 0.0114	mg/kg	
Vinyl Chloride	< 0.0114	mg/kg	
Solids, Total (%) by (b) (4) on 08/14/89			Std. Mtd. 209F
Total Solids	98 . 1	%	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: **BCM Eastern Inc.** 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 1948 215-825-3800

PAGE

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Date

08/29/89

2

BCM #

00-6471-01

P.O.#

Date Sampled :

Order# : 29200

BCM Number :

923863

Location Client ID

MW-10A-1.5

Date Received :

08/01/89

08/01/89

Sampler

ES

Test Description

Results

Units Test Method

Comment: All applicable results for this sample reported on dry weight basis



1850 Gravers Road Norristown, PA 19401

(215) 275-0281

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

PLEASE REMIT CHECKS TO BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 198 215-825-3800

PAGE

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Date

08/29/89

BCM #

00-6471-01

P.O.#

Order# : 29200

BCM Number :

923864

Location

: B-5-1..5

Client ID

Date Sampled :

08/01/89

Date Received :

08/01/89

Sampler

ES

Test Description	Results	Units Test Method
Purgeable Halocarbons by (b) (4) 08/18/86		EPA # 8010
1,2-Dichlorobenzene	₹ € 0.0141	mg/kg
1.3-Dichlorobenzene	< 0.0141	mg/kg
1,4-Dichlorobenzene	(0.0141	mg/kg
Bromoform	<. 0.0141	mg/kg
Carbon Tetrachloride	(0.0141	mg/kg
Chloropenzene	< 0.0141	mg/kg
Dibromochloromethane	< 0.0141	mg/kg
Bromodichloromethane	< 0.0141	mg/kg
Chloroathana	< 0.0141	mg/Kg
Chloroform	(0.0141	mg/kg
1,1-Dichloroethane	(0.0141	mg/kg
1.2-Dichloroethane	< 0.0141	mg/kg
1,1-Dichloroethene	> 0.2	mg/kg
1,2-Dichloropropane	< 0.0141	mg/kg
Cis-1,3-Dichloropropene	< 0.0141	mq/kg
Trans-1,3-Dichloropropens	< 0.0141	mg/kg
Bromomethane (Methyl Bromide)	< 0.0141	mg/kg
Chloromethane (Methyl Chloride)	< 0.0141	mg/kg
Methylene Chloride	< 0.0141	mg/kg
1,1,2,2-Tetrachloroethane	< 0.0141	mg/Kg
Tetrachloroethene (PCE)	< 0.0141	mg/kg
Trans-1,2-Dichloroethene	< 0.0141	mg/kg
1,1,1-Trichloroethane	< 0.0141	mg/kg
1,1,2-Trichloroethane	< 0.0141	mg/kg
Trichloroethane (TCE)	> 2	mg/kg
Trichlorofluoromethane	< 0.0141	mg/kg
Vinyl Chloride	< 0.0141	mg/kg
Solids, Total (%) by (b) (4) on 08/14/89		Std. Mtd. 209
Total Solids	70.7	*



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FINAL REPORT This is a final report.

The results have been checked and authorized for release.

PLEASE REMIT CHECKS TO: BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

PAGE

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Date

98/29/89

BCM # :

00-6471-01

P.O.# :

١

Order# : 29200

BCM Number :

923864

Location Client ID

: B-5-1.5

Date Samples : 08/01/89

Date Received : 08/01/89

Sampler

E8

Test Description

Results

Units Test Method

Comment: All applicable results for this sample reported on dry weight basis

Comment:

QUALITATIVE RESULTS ONLY, DUE TO PEAK AREAS OUTSIDE OF CALIBRATION CURVE.



1850 Gravers Road: Norristown, PA 19401 (215) 275-0281

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

PLEASE REMIT CHECKS SCM Scatern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING PA 19404

PAGE

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Date 08/29/89

BÇM # : 00-6471-01

P.O.#

Order# : 56500

BCM Number : 923865

Client ID :

Date Sampled : 08/01/89 Date Received : 08/01/89

Location : 8-5-3.5

Sampler

Test Description	Results	Units	Test Method
Purgeable Halocarbons by (b) (4) on 08/03/8	9		EPA # 8010
1,2-Dichloropenzone	< 0.116	mg/kg	
1,3-Dichloropenzena	< 0.116	mg/kg	
1,4-Dichloropenzene	₹ 0.116	mg/kg	1. 1. 2.
Bromoform	< 0.116	mg/kg	¥2
Carbon Tetrachloride	< 0.116	mg/kg	
Chlorobenzene	< 0.116	mg/Kg	·
Dibromochloromethane	< 0.116	mg/kg	
Bromodichloromethane	> 4	mg/kg	
Chloroethane	· < 0.116	mg/kg	
Chloroform	< 0.116	mg/kg	
1,1-Dichlorosthane	> 1	mg/kg	
1,2-Dichloroethane	< 0.116	mg/kg	
1,1-Dichlorosthene	> 20	mg/kg	
1,2-Dichloropropane	₹ 0.116	mg/kg	
Cis-1,3-Dichloropropene	< 0.116	mg/kg	
Trans-1,3-Dichloropropene	< 0.116	mg/kg	
Bromomethane (Methyl Bromide)	< 0.116	mg/kg	
Chloromethans (Methyl Chloride)	< 0.116	mg/kg	
Methylene Chloride	> 0.5	mg/kg	
1,1,2,2-Tetrachloroethane	< 0.116	mg/kg	* .
Tetrachloroethene (PCE)	< 0.116	mg/kg	
Trans-1,2-Dichloroethene	< 0.116	mg/kg	•
1,1,1~Trichloroethane	> 40	mg/kg	
1,1,2-Trichlorosthane	< 0.116	mg/kg	
Trichloroethene (TCE)	> 20	mg/kg	
Trichlorofluoromethane	< 0.116	mg/kg	
Vinyl Chloride	< 0.116	mg/kg	
Solids, Total (%) by (b) (4) on 08/14/89			Std. Mtd. 209F
Total Solids	86.0	%	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO **BCM Eastern Inc.** 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 1946 215-825-3800

PAGE

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

08/29/89

BCM # :

00-6471-01

P.O.#

Order# :

29200

BCM Number : 923865

Location Client ID

: B-5-3.5

Date Sampled : Date Received :

08/01/89

Sampler

08/01/89

Test Description

Results

Units Test Method

Comment: All applicable results for this

sample reported on dry weight basis

Comment:

QUALITATIVE RESULTS ONLY, DUE TO PEAK AREAS OUTSIDE CALIBRATION CURVE.



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHEC **BCM Equium Inc.** 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 1945 215-825-3800

PAGE

7

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

SCM MALL

00-6471-01

Date

08/29/89

BCM #

00-6471-01

P.O.#

Order# : 29200

BCM Number :

923866

Location Client ID : 8-5-4.5

Date Sampled : Date Received :

08/01/89

Sampler

08/01/89 ES

Test Description	Results	Units	Test Method
Purgeable Halocarbons by (b) (4) on 08/03/89			EPA # 8010
1,2-Dichlorobenzene	< 0.116	mg/kg	
1,3-Dichlorobenzene	< 0.116	mg/kg	
1,4-Dichlorobenzene	₹ 9.116	mg/kg	
Bromoform	(0.116	mg/kg	
Carbon Tetrachloride	< 0.116	mg/kg	
Chlorobenzene	< 0.116	mg/kg	
Dibromochloromethane	< 0.116	mg/kg	
Bromodichlofomethame	> 0.1	mg/kg	
Chloroethane	< 0.116	mg/kg	
Chloroform	< 0.116	mg/kg	
1,1-Dichloroethane	> 1	mg/kg	
1,2-Dichloroethane	> 0.116	mg/kg	
1,1-Dichloroethene	> 20	mg/kg	
1,2-Dichloropropane	< 0.116	mg/kg	
Cis-1,3-Dichloropropene	< 0.116	mg/kg	
Trans-1,3-Dichloropropene	< 0.116	mg/kg	
Bromomethane (Methyl Bromide)	< 0.116	mg/kg	
Chloromethane (Methyl Chloride)	< 0.116	mg/kg	
Metnylene Chloride	> 1	mg/kg	
1,1,2,2-Tetrachloroethane	¢ 0.116	mg/kg	
Tetrachloroethene (PCE)	< 0.116	mg/kg	
Trans-1,2-Dichloroethene	< 0.116	mg/kg	
1,1,1-Trichloroethans	> 50	mg/kg	
1,1,2-Trichloroethane	< 0.116	mg/kg	
Trichloroethene (TCE)	> 10	mg/kg	
Trichlorofluoromethane	< 0.116	mg/kg	
Vinyl Chloride	< 0.116	mg/kg	
Solids, Total (%) by (b) (4) on 08/14/89			Std. Mtd. 209F
Total Solids	86.5	*	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281 PLEASE REMIT CHECKS TO.

BCM Edition Inc.

1 PLYMOUTH MEETING
PLYMOUTH MEETING, PA 19482
215-825-3800

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Date

PAGE

08/29/89

BCM # :

00-6471-01

P.Q.# : Order# :

29200

BCM Number :

923866

Location :

8-5-4.5

Client ID :

Date Sampled :

08/01/89

Date Received :

08/01/89

Sampler

ES

Test Description

Results

Units Test Method

Comment: All applicable results for this

sample reported on dry weight basis

Comment:

QUALITATIVE RESULTS ONLY, DUE TO PEAK AREAS OUTSIDE OF CALIBRATION CURVE.



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS BCM Equipm Inc.
1 PLYMOUTH MEETING PLYMOUTH MEETING, PAR TRIPS 215-825-3800

PAGE

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL 00-6471-01 Date 08/29/89 BCM #

P.Q.#

00-6471-01

Order# :

29200

BCM Number :

923867

Location

: B-5-6.5

Client ID

Date Sampled : Date Received :

08/01/89 08/01/89

Sampler |

E\$

Test Description	Results	Units	Test Method
purgeable Halocarbons by (b) (4) on 08/03/8	9		EPA # 8010
1,2-Dichloropenzene	< 0.116	mg/kg	
1,3-Dichloropenzene	< 0.116	mg/kg	
1,4-Dichlorobenzene	< 0.116	mg/kg	ee45.
Bromoform	< 0.116	mg/kg	A
Carbon Tetrachloride	< 0.116	mg/kg	
Chlorobenzene	< 0.116	mg/kg	
Dibromochloromethane ·	< 0.116	mg/kg	
Bromodichloromethane	> 0.5	mg/kg	
Chlorosthane	< 0.116	mg/kg	
Chloroform	< 0.116	mg/kg	
1,1-Dichloroethane	> 1	mg/kg	
1,2-Dichloroethane	< 0.116	mg/kg	
1,1-Dichlorosthene	> 3	mg/kg	
1,2-Dichloropropane	< 0.116	mg/kg	
Cis-1,3-Dichloropropene	< 0.116	mg/kg	
Trans-1,3-Dichloropropene	< 0.116	mg/kg	
Bromomethane (Methyl Bromide)	< 0.116	mg/kg	
Chloromethane (Methyl Chloride)	< 0.116	mg/kg	
Methylane Chloride	> 0.1	mg/kg	
1,1,2,2-Tetrachlorosthans	₹ 0.116	mg/kg	
Tetrachloroethene (PCE)	< 0.116	mg/kg	
Trans-1,2-Dichlorosthene	< 0.116	mg/kg	
1,1,1-Trichlorosthans	> 4	mg/kg	
1,1,2-Trichloroethane	₹ 0.116	mg/kg	
Trichloroethene (TCE)	> 8	mg/kg	
Trichlorofluoromethane	₹ 0.116	mg/kg	
Viny1 Chloride	< 0.116	mg/kg	
Solids, Total (%) by (6) (4) on 08/14/89			Std. Mtd. 2091
Total Solids	86.3	*	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 1948 215-825-3800

PAGE

PLEASE REMIT CHECKS TO

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

08/29/89

BCM # :

00-6471-01

P.O.#

Order# :

29200

BCM Number :

923867

Location Client ID 8-5-6.5

Date Sampled : Date Received :

08/01/89 08/01/89

......

Sampler

Test Description

:

Results

١

Units Test Method

Comment: All applicable results for this

sample reported on dry weight basis

Comment:

QUALITATIVE RESULTS ONLY, DUE TO PEAK AREAS OUTSIDE OF CALIBRATION CURVE.



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 1 215-825-3800

PAGE

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Date 08/29/89

BCM # : 00-6471-01

P.O.# :

Order# : 29200

BCM Number : 923868

Location : 8-6-1.5

Client ID :

Date Received : 08/01/89 : ES

Date Sampled : 08/01/89

Sampler

Test Description	Results	Units Test	Method
Purgeable Halocarpons by (b) (4) on 08/03/8	9	EPA	8010
1,2-Dichlorobenzene	< 0.115	mg/kg	
1,3-Dichlorobenzene	₹ 0.115	mg/kg	
1,4-Dichlorobenzene	< 0.115	mg/kg	
Bromoform	< 0.115	mg/kg	
Carbon Tetrachloride	< 0.115	mg/kg	
Chlorobenzene	< 0.115	mg/kg	
Dibromochloromethane	< 0.115	mg/kg	
Bromodichloromethane	< 0.115	mg/kg	
Chloroethane	< 0.115	mg/kg	
Chloroform	< 0.115	mg/kg	
:,1-Dichloroethane	> 3	mg/kg	
1,2-Dichloroethane	< 0.115	mg/kg	
1,1-Dichloroethene	> 10	mg/kg	
1,2-Dichloropropane	< 0.115	mg ∕kg	
Cis-1,3-Dichloropfopene	< 0.115	mg/kg	
Trans-1,3-Dichloropropene	< 0.115	mg/kg	
Bromomethane (Methyl Bromide)	< 0.115	mg/kg	
Chloromethane (Methyl Chloride)	₹ 0.115	mg/kg	
Methylene Chloride	> 0.2	mg/kg	
1,1,2,2-Tetrachloroethane	< 0.115	mg/kg	
Tetrachloroethens (PCE)	< 0.115	mg/kg	
Trans-1,2-Dichloroethene	< 0.115	mg/kg	
1.1,1-Trichlorosthans	> 5	mg/kg	
1,1,2-Trichlorosthans	< 0.115	mg/kg	
Trichloroethene (TCE)	> 10	ng/kg	
Trichlorofluoromethane	< 0.115	mg/kg	
Vinyl Chloride	< 0.115	mg/kg	
Solids, Total (%) by (b) (4) on 08/14/89		Std.	Mtd. 20
Total Solids	86.8	1,	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19482 215-825-3800

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

08/29/89

BCM * :

00-6471-01

P.O.# :

Date

PAGE

Order# : 29200

BCM NUMBER : Location Client ID

923868

B-6-1.5

Date Sampled : 08/01/89

Date Received :

08/01/89

Sampler

Test Description

Results

Units Test Method

Comment: All applicable results for this sample reported on dry weight basis

Comment:

QUALITATIVE RESULTS ONLY, DUE TO PEAK AREAS OUTSIDE OF CALIBRATION CURVE.



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PAGE

BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462

PLEASE REMIT CHECKS TO:

215-625-3800

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

BCM # 00-6471-01 P.O. #

Order# :

29200

BCM Number :

923869

Location : 8-6-5.5

Client ID

Date Received :

Date Sampled :

08/01/89 08/01/89

08/29/89

Sampler

E8

Test Description	Results	Units	Test Method
Purgeable Halocarbons by (b) (4) on 08/03/89			EPA # 8010
1,2-Dichlorobenzene	< 0.118	mg/kg	
1,3-Dichlorobenzene	< 0.118	mg/kg	•
1,4-Dichlorobenzene	< 0.118	mg/kg	1 2 2 2 2
Bromoform	< 0.118	mg/kg	(A) (3)
Carbon Tetrachloride	< 0.118	mg/kg	
Chlorobenzene	< 0.118	mg/kg	7.4
Dibromochloromethane	< 0.118	mg/kg	•
Bromodichloromethane	< 0.118	mg/kg	
Chloroethane	< 0.118	mg/kg	
Chloroform	< 0.118	mg/kg	
1,1-Dichloroethane	> 0.7	mg/kg	
1,2-Dichloroethane	< 0.118	mg/kg	
1,1-Dichloroethene	> 10	mg/kg	
1,2-Dichloropropane	< 0.118	mg/kg	
Cis-1,3-Dichloropropene	< 0.118	mg/kg	
Trans-1,3-Dichloropropene	< 0.118	mg/kg	
Bromomethane (Methyl Bromide)	< 0.118	mg/kg	
Chloromethane (Methyl Chloride)	< 0.118	mg/kg	
Methylene Chloride	> 0.1	mg/kg	
1,1,2,2-Tetrachloroethane	< 0.118	mg/kg	0.00
Tetrachloroethene (PCE)	< 0.118	mg/kg	
Trans-1,2-Dichlorosthene	< 0.118	mg/kg	
1,1,1-Trichloroethane	> 5	mg/kg	
1,1,2-Trichloroethane	< 0.118	mg/kg	
Trichloroethene (TCE)	> 10	mg/kg	
Trichlorofluoromethane	< 0.118	mg/kg	
Vinyl Chloride	< 0.118	mg/kg	
Solids, Total (%) by (b) (4) on 08/14/89			Std. Mtd. 209F
Total Solids	84.8	*	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: **BCM Eastern Inc.** 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

PAGE

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

08/29/89

BCM #

00-6471-01

P.O. .

Order# :

29200

BCM Number :

923869

Location Client ID

Date Sampled :

08/01/89

Date Received :

l

08/01/89

Sampler

Test Description

Results

Units Test Method

Comment: All applicable results for this

sample reported on dry weight basis

QUALITATIVE RESULTS ONLY, DUE TO PEAK AREA OUTSIDE OF CALIBRATION CURVE.



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECK BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

PAGE

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Date 08/29/89 00-6471-01

BCM # P.O.#

Order# : 29200

BCM Number :

923870

Location Client ID

: TRIP BLANK

Date Sampled :

07/31/89

15

Date Received :

08/01/89

Sampler

E\$

Test Description	Results	Units	Test Method
Purgeable Halocarbons by (b) (4) on 08/14	1/89		EPA # 601
1,2-Dichloropenzene	< 1	ug/l	
1,3-Dichlorobenzene	< 1	ug/l	
1,4-Dichlorobenzene	< 1	ug/l	
Bromoform	< 1	ug/l	
Carbon Tetrachloride	< 1	ug/l	•
Chlorobenzene	< 1	ug/l	
Dibromochloromethane	< 1	ug/l	
Bromodichloromethane	< 1	ug/l	
Chloroethane	< 1	ug/l	
Chloroform	< 1	ug/1	
1,1-Dichloroethane	< 1	ug/l	
1,2-Dichloroethane	< 1	ug/1	
1,1-Dichloroethene	< 1	ug/1	
1,2-Dichloropropane	< 1	ug/l	
Cis-1,3-Dichloropropens	< 1	ug/1	
Trans-1,3-Dichloropropene	< 1	ug/l	
Bromomethane (Methyl Bromide)	< 1	ug/l	
Chloromethane (Methyl Chloride)	< 1	ug/l	
Methylene Chloride	< 1	ug/l	
1,1,2,2-Tetrachloroethane	< 1	ug/l	
Tetrachloroethene (PCE)	< 1	ug/l	
Trans-1,2-Dichloroethene	< 1	ug/l	
1,1,1-Trichloroethane	< 1	ug/l	
1,1,2-Trichloroethane	< 1	ug/l	
Trichloroethene (TCE)	< 1	ug/1	
Trichlorofluoromethane	< 1	ug/l	
Vinyl Chloride	< 1	ug/1	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO BCM Scalem Fro.

1 PLYMOUTH MEETING
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH MEETING, PA 1848
PLYMOUTH PA 1848
PLYMOUTH PA 1848
PLYMOUTH PA 1848
PLYMOUTH PA 1848
P

PAGE

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

8CM MALL

00-6471-01

Date

BCM # :

00-6471-01

P.O.# :

Order# : 29200

BCM Number : 923871

Location : FIELD BLANK

Client ID :

Date Sampled :

08/01/89

Date Received : 08/01/89

Sampler : ES

Test Description	Results	Units	Test Method
	~~~~~~~~~		
Purgeable Halocarbons by (b) (4) on 08/03/89			EPA + 601
1,2-Dichloropenzane	< 1	ug/l	
t,3-Dichlorobenzene	< 1	ug/l	
1.4-Dichlorobenzene	< 1	ug/l	
Bromoform	< 1	ug/l	\$ 34.5
Carbon Tetrachloride	<b>&lt; 1</b>	ug/l	
Chlorobenzene	< 1	ug/l	
Dibromochloromethane	< 1	ug/l	
Bromodichloromethane	< 1	ug/l	
Chloroethane	< 1	ug/l	
Chloroform	< 1	ug/l	
1,1-Dichloroethane	<b>&lt; 1</b>	ug/l	
1,2-Dichloroethane	< 1	ug/l	
i,i-Dichloroethene	< 1	ug/l	
1,2-Dichloropropane	< 1	ug/l	
Cis-1,3-Dichloropropene	<b>&lt; 1</b>	ug/l	
Trans-1,3-Dichloropropene	< 1	ug/l	
Bromomethane (Methyl Bromide)	<b>&lt; 1</b>	ug/l	
Chloromethane (Methyl Chloride)	< 1	ug/l	
Methylene Chloride	5.6	ug/l	
f,1,2,2-Tetrachloroethane	< 1	ug/l	
Tetrachloroethene (PCE)	<b>&lt; 1</b>	ug/l	
Trans-1,2-Dichloroethane	<b>&lt; 1</b>	ug/l	
1,1,1-Trichloroethane	< 1	ug/l	
1,1,2-Trichloroethane	< 1	ug/l	
Trichloroethene (TCE)	<b>&lt; 1</b>	ug/l	
Trichlorofluoromethane	< 1	ug/l	
Vinyl Chloride	< 1	ug/l	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

| PLEASE REMIT CHECKS TO BCM Eastern Inc. PLYMOUTH MEETING, PA - 194 215-825-3800

PAGE

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL .

00-6471-01

Sampler

Date

98/89/89 00-6471-01

P.O.# :

Order# : 29200

BCM Number : 923871

Certified by :

Location

: FIELD BLANK

Client ID

Date Sampled : 08/01/89 Date Received : 08/01/89

20

Test Description

Results

Units Test Method

BCM Laboratory Director

Lab Certifications:

PA - 46-007 AL - 40300

NJ - 77175 MD - 136

EPA BULK ASBESTOS QC - 3339

١



1850 Gravers Road Norristown, PA 19401 (215) 275-0281 PLEASE REMIT CHECKS TO: 8CM Equiem Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA. 19462 215-825-3800

FASE



LIAL FERGRT

<u> 11:00 ಕ್ರಮಿಸಿಕ ಬರ</u>

This is a final report

The Tabults have been checked and authorized for release.

CHEMI

OPRIST<u>IANA METALS</u> CORP :

ATTH: (b) (4)

BCM MALL

20-6471-01

Date

08/16/89

SCM #

00-6471-07

2 €.≒

Order# : 2

29266

80% number / 924:50 Lucation / West-1-1 3

Date Received

08/03/89 08/03/89

Sampler

ES

vest dispersection 495UL.5 Units Test Method Migeboie Helbderbons by on 58/04/89 010E # AGE ....Cidhidracentene 1 0.0116 mg, K₫ ., 3-D. Chioricanzene 1 0.0116 .ng/kg :,4-Dichlarabenzene < 0.0116 mg/Kg 3/15/00/10/16 < 0.0116 mg/kg Carcon Tatrachieride 1 0.0116 mg/kg mg, kg < 9.0113 unitropenzene 1:promounloremethane < 0.0115 mg/Kg aromodichioromethana ₹ 0.0116 mg/Kg Inlerdethane < 0.0116 mg/kg ಪ್ರತಿಕ್ಷದ ನಿರ್ವಹಣೆ < 0.0116 mg/kg 1,1-0.chloroethans < 0.0116 mg/kg L-Lighidhdetmane < 0.613 mgzkg -Cluatorostaene C U.Q116 mg/Rg i distantarapropane 0.0113 mg/kg Cis-1,3-Dichloropropene < 0.0115 mg/kg < 0.0118 irans-1,3-Dichloropropane 前項ノドネ Bromomethane (Methyl Ecomide) 0.0116 mg/kg Chibromethane (Methyl Chibride) < 0.0115 mg/Kg Gethylene Chiorics 0.036: mg/kg .,i,2,2-Tatrachlorostname < 0.0118 mg/s.q < 0.0116 Tatrauniordathane (PUE) mq/Kq insha-1.1-0:chlordethens · ).9115 mgzką i.f,i-Trichlorcathans < 0.0116 mg/Kg 1. . . 2-Trichlordeinana 4 0.3116 mg/kg Titomiordethame (TCE) : 0.6115 mg, kg Prighters tuerchethane . 0 0116 mg/kg cinvi chicris 1.0.0116 mg. kg editae (fotal (4) ay 🧗 Sta. Mtd. 209F on 63/14/39 86.5 Total Bolids



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

FINAL REPORT

Tolis is a final report.

The :33ult3 have been phecked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATT (. (b) (4)

BOM MALL

JO-6471-01

--JE

Date : 08/16/89

8CM # :

00-6471-07

P.Q.# :

Order# : 29266

acm Number . ocation .

Client 10 -

924:50

16W-11-1.5

Date Sampled : 08/02/89

Date Received :

08/03/89

Sampler

Test Lescription

Results

Unit3 Test Method

Comment: All applicable results for this sample reported in any weight basis



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

| | PLEASE REMIT CHECKS TO BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19482 215-825-3800

SINAL RESIRT

This is a fonal report.

is results have been inecked and authorized for release.

PAGE

3

CHRISTIANA METALS CORP

(b) (4)

dCM MALL

(0-6471-01

Date : 08/16/89

F.O.# :

SCM # : 00-6471-07

Order# : 29266

Sem Number

924151

Date Sampled :

08/02/89

_00Stion

WW-11-9 5

Date Received :

08/03/89

c1.ant 10	Sar	mpler	: <b>ES</b>
test pospriction	Résults	Jnits	Test Method
Pargesple Halcoarbons by 00000000000000000000000000000000000			EPA # 8010
1,2-2:0Mloropenzene D	< 0.0117	mg/kg	
1,3-Dichloropenzene	< Q.Q117	mg/kg	<b>14</b> 5 €
1.4-Dichlorobenzene	< 0.0117	mg/kg	- North
Bromoform	< 0.0117	mg/kg	
Carbon Tetrachloride	< 0.0117	mg/kg	
Chiscopenzena	€ 0.0117	mg/kg	
Dipromochloromethane	< 0.0117	mg/kg	
Scomodichloromethane	< 0 0117	mg/kg	
Chicroethane	< 0.0117	mg/kg	
UP 15.50 t 4 mm	€ 0.0117	mg/kg	
1,1-D:chloroathane	< 0.0117	mg/kg	
1,2-bishishgeth <b>ane</b>	< 0.0117	mg/kg	
:::-0.chioroethene	0.0117	mo/kg	
:.2-U:Chibropropana	0.0117	mg/kg	
Cis-:,5-Dichioropropene	< 0.0117	mg/kg	
Frans-+,3-5ichloropropene	< 0.0117	mg/Kg	
Bromomethane (Methyl Eromide)	< 0.0117	mg/kg	
Uniteromethane (Methyl Chloride)	0.0117	mgzkg	
Wathylene Chioride	0.0231	mg/kg	
:,:,2,2-Tetrachlorosthane	( 0.0117	mg/kg	
Tetrasmioroeth <b>ene</b> (PCE)	< 0.0117	mg/kg	
rams-1,2-Dichloroethene	C 0.0117	mg/kg	
t,t,:-Trichlorosthane	< 0.0117	mg/kg	
1,1,2-frichlordethane	< 0.0117	mg/kg	
Trichloroeth <b>ene</b> (TOE)	0.0223	mg/kg	
Trichlorofiuorom <b>athans</b>	< 0.0117	mg/r.g	
7:AV1 Inionias	< 0.0117	mgz F.g	
Solids. For all (%) by $H_{0}^{(b)}(4)$ from 08/14/89			Std. Mtd. 209F
Tota. Stlies	85.3	1.	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

| PLEASE REMIT CHECKS TO: BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

FAGE

FIRE REACRT

This is a final recort

The Tabulta have been chacked and authorized for ralease

CHRISTIANA METALS CORP.

— (b) (4)

SCM MALL

30-6471-01

Date

08/16/89

SCM #

00-6471-07

P 0.#

Order# :

29266

acm Humber

924151

W-11-9 5

Date Sampled :

Sampler

08/02/89

LOCATION

Date Received

08/03/89

client 10

Test Description

Results

Units Test Method

comment. All applicable results for this sumple reported on dry weight basis



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: **BCM Eastern Inc.** 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

₽AGE.



FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

ECM MALL

60-6471-01

Date

08/16/89

3CM # :

00-6471-07

P 0.#

Order# : 29266

BCM Number : 924152

Date Sampled

08/02/89

....

Location

<u>: 3-7-1 5</u>

Date Received :

08/03/89

Cliant ID .

		•	. •	
(est) ússcription	Results	Units	Test Meti	nod
Purgeable Haiocarbons by (b)(4) on 08/04	,, <u>8</u> 9		EPA # 80	10
1,2-Dichloropenzene	< 0.0116	mgzkg		
1,3-Dichloropenzene	< 0.0116	mg/kg		or the San
1,4-D:chlorcbenzene	< 0.0116	mg/kg	• • • •	200
3romoform -	< 0.0116	mg/kg		
Carpon Tatrachicride	₹ 0.0116	mg/kg		annian Anda
Iniorodenzene	€ 0.0116	mg/kg		
Dipromocnioromethane	€ 0.0115	mg/kg		·
Sromod:chloromethane	< 0.0116	mg/kg		
Chlorcethane	< 0.0116	mg/kg		
Chioroform	< 0.0116	ri <b>g</b> /kg		ř.
), :-D:onlorsethane	< 0.0116	mg/Kg		-
(,2-D.:nlorostname	< 0.0116	mg/l.g		
:,1-Dichlorsethene	€ 0.0115	mg/Kg		
.,2-Etonionopropane	€ 0.0116	mg/kg		
Cis-:,3-010n10r0propene	< 0.011€	mg/kg		
Trans-1.3-Bionloropropena	( 0.0116	mg/kg		
Bromomethane (Methyl Bromide)	< 0.0116	mg/kg		
Chloromethane (Methyl Chloride)	< 0.0116	mg/kg		,
Methylana Chicride	0.0337	mg/kg		192
1,1,2,2-Tatrachloroethane	< 0.0116	mg/kg		
Tetraclorosthems (PCE)	< 0.0116	mg/kg		
Trans-1,2-Dichloroethene	< 0.0116	m <b>g</b> /kg		
1,1,1-Trickloroethane	< 0.0116	mg/kg		. 5
:,1,2-Trichloroethane	< 0.0116	mg/kg		
frichicrosinana (TGE)	< 0.0115	mg/kg		
Trichlorofluoromethane	< 0.0116	mg/kg		
Vinvl Inloride	6 0.0116	mg, kg		
SG1:35, Total (%) b(b)(4)Simpon 08/14/89			Sta. Mta.	209F
Total Solids	86.1	<b>7.</b>		



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

PAGE

FIRAL REPORT

This is a final report.

The results have been checked and authorized for release.

CHRISTIANA METALS CORP

ATTN. (b) (4) BCM MALL

00-6471-01

Date : 08/16/89

Õ

ECM #

00-6471-07

P.O.#

Order# : 29266

BOM Number : 924152

Date Sampled : 08/02/89

Location

8-7-1 5

Date Recsived

Sampler

08/03/89

Tilent ID :

Test Description

Results

Units Test Method

Comment: All applicable results for this

sample reported on dry weight basis



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19 215-825-3800

PAGE

I HAL WEPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BOM MALL

00-6471-01

Date : 08/16/89

3CM # :

00-6471-07

P.O.# :

Order# : 29266

Bild Warmser

924:53

3-7-10.5 Location

Date Sampled : 08/02/89

Date Received :

08/03/89

(1.30. 13

Sampler

Test Description	Results	Units	Test Method
7-1/41			
-urgaable maiocarsons by (b) (4) on 03/04/89			EPA # 8010
:.d-B.chlcrobenzene	( 0.0119	mg/kg	
.,3-Dichloropenzena	< 0.0119	mg/kg	HONE TO
+,4-Dichloropenzene	< 0.0119	mg/kg	* ******
3romoform	← 0.0119	mg/kg	T
Carpon Tetrachloride	< 0.0119	mg/kg	
inicrocenzene	< 0.0119	mg/kg	
@ioremochloromethane	< 0.0119	mg/kg	
aromotichiorimethane	< 0.0119	mg/kg	
Chlorsethane	< 0.0119	mg/kg	
_N_2) ಕರಕರಕ <b>್</b>	€ 0.0119	mg/kg	
-,:-Enantaraethane	< 0.0119	mg/kg	
z-Broatoroethane	€ 0.0119	nig/kg	
- :-Urchicrostnene	0.0705	mg/kg	
3-010nioropropane	< 0.0119	mg/kg	
1.5-1 3-01chluropropene	< 0.0119	mg/kg	
//a/s-/,3-Cronlaropropene	€ 0.0119	mg/kg	
Bromomethane (Methyl Bromide)	< 0.0119	mg/kg	
Caloromethane (Methyl Chioride)	< 0.0119	mg/kg	
Mathylana Chlofias	0.0311	mg/kg	
, ,1,2-Tatrachloruethane	< 0.0119	mg/kg	
Tatrasmiordethene (PCE)	< 0.0119	mg/kg	•
rans-1,2-Dichlordathene	< 0.0119	mg/kg	
(, ), 1-Trichlordethane	< 0.0119	mg/kg	
ili 1-Trichloroethane	< 0.0119	mg/kg	
frichloroethene (TCE)	< 0.0119	mg/kg	
n_onlorofidoromethane	< 0.0119	mg/Kg	
y. Wi 1.105.08	< 0.0119	mg/kg	
EU1:05. Total A) by (b) (4) on 08/14/89			Std. Mtd. 209F
701a1 001:35	83.7	٧.	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281



Filmer LEGST

This is a final repirt.

The results have deam checked and authorized for release.

CHAISTIANA JETAL (b) (4)

(b) (4)

BOM WALL

30-0471-01

PACE

Date : 08/16/89

SCM #

00-6471-07

₽.3.#

Order# : 29266

BOA NUMBER di Ibo.

Lisant Lü

924:53

<u>8-7-:0</u>.

Date Sampled : 08/02/89

_____

Date Received : 08/03/89

Sample:

ΞS

ist usecription

Fesultz Units Test Method

Comment. All supricable results for this

- sample reported on any weight pasis



1850 Gravers Road Norristown, PA 19401 (215) 275-0281 PLEASE REMIT CHECKS TO: BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19422 215-825-3800

12-14-62

Sui su à final report

ficulorofiliatomethene

501103. ():tal .%) by (b) 3: --- on 09:14/89.

Finyl Chloride

Total 501.08

The results have been interest and authorized for release.

ಾಗಿಆ≗

CLIENT				** ***
	CHRISTEANA METALS DORP ATT4: (b) (4) BOM MALL DO-6471-01		Date SCM # P O.# Order#	08/16/89 00-6471-07 29266
Elm mumber Location :	924154 8-7-10,5A		Date Sampled Date Raceived	08/50/89 98/50/86
11.ant 15			sempler	ES
	tion	F88ults	Chins	last detnod
ಸವಸ್ಥಿಧಿಕೆಖಕಡ ⊣a	10 <b>carbons</b> by . <mark>(b) (4)</mark> on 03/04/89			EPA # 8010
,d-bichio	robenzene	0.0117	m <b>g</b> / Kg	\$ 1 P
.:-6:3113	robenzene	( 0.0117	ng/kg	
:/4-brunla	ropenzene	< 0.0117	mg/kg	
ard Hoform		< 0 0117	m <b>g</b> 7⊱. <b>g</b>	
Garbon Tat	rachioride	< 0.0117	mg≠kg	,
. Diginopenz		v 0.0117	m <b>g</b> ∠⊗@	
	cromethane	< 0.0117	т <b>д</b> , Ка	
	oromethane	√ 0.0117	ជាផ្នាក់ អាថ្មិ	
luiutaat a		4 0.0117	mg≠kg	
hidrafar		- C.O.17	មាធិ∆∞ ធ	
1 2.0010	rcetiane	4 0.0117	толыц	
u-0.3613		4.0.3117	កាធ្វ/ .ថ្ន	
r vidil		0.0420	កល្អ, អាជ្ញ	
. a u : 3//40		0 0117	-ng/g	
	chloropropera	0 0117	mg/kg	
	Signioropene	0.0117	w∄\+ ā	
	de (Methyl Bromide)	( 0.0117	mgykg	
	ane (Wethyl Chloride)	< 0.0117	mgzkg	
Methylens		0.0350	mgzkg	
, , -	tracalorcethane	0.0117	ան չեն	•
	cethene (202)	0.0117	mg, Eg	
· ·	Cichiordethene	0 0:17	ng/) g	•
	Aloroethane	< 3.0117	mg√kg	
	niorcetnane	€ 0.0117	ng/kg	
Tricularde	thana (TCE)	0.219	mā, kā	

1 0.0117

< 0.0117

35.7

ngzka

mg / Kg

Std. Mtd. 209F



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: **BCM Eastern Inc.** 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 2 215-825-3800

FASE

This is a final report

e results have been checked and suthorized for release

WHRISTIANA METALS CORP

(b) (4)

ECM MALL

30-6471-01

Cate

08/16/89

SCM # ·

00-6471-07

ಾ ರ.≉

Order# - 29266

304 Humber -924154

Bi uisuntation

Date Sampled

08/02/89

Date Received

Sampler

08/03/89

ditent 15

RESUlts

Units Test Method

ES

larment will applicable results for this

- Bampia (Eported on dry weight cools



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

FAJE

Const #88608%

% .5 (L & final /eport

The results have been insched and authorized for release.

CHRISTIANA METALS CORP

 $A:T_N$ . (b) (4)

SCM MALL J0-5471-01

Date .

08/16/89

acm ≠ .

00-6471-07

 $P_{i} \subseteq T$ 

Order# . 29266

LLD Number LOCATION.

Cluant IJ

924155

8-7-13

Date Sampled .

08/02/89

Jata Received

08/03/89

5**a**mplar

: ES

. det desarret.un	4854118	Units "	'ast Method
Fungasia malocarpona pr	9		PA # 8010
.,z-bisaloribenzene D	0 0134	mg/kg	
1.1 Old tiontoenzene	0.0134	mg/kg	* : ' v _{e.,}
:,4-C.Chlorobenzene	< 0.0134	mg/kg	
មិន <b>និស្សា</b> ÷្	€ 0.0134	äg∠kg	
Cardon Tetraphionide	< 0 0134	mg/lig	
lhistopensens	< 0.0134	#' <b>g</b> / k g	
Dipromocaloromath <b>ane</b>	< 0.0134	mg/4q	
Brimodionionomechane	< 0.0134	ത്യൂൾ പ്രമ	
1::10f7ethana	< 0.0134	mg/Kg	
Grades sem	೦ ಕತ2	mgzi.g	
<pre>! !-C.Chlorcethane</pre>	0.0134	mg/ig	
1.2-0.Chioroethane	< 3.0134	€.gr,/ អ.g	
:, : -E:: ::::::::::::::::::::::::::::::	0.0461	កាជ្ជ / <b>ក</b> ជ្ជា	
e-Unchioropane	0.1:34	mg7kg	
lis-: 3-Dichlurd <b>propene</b>	: 0.0134	mg/kg	
Trans-1,3-2.calbropropene	5 0.0134	ារដ្ឋាភា ខេត្ត	
tromomethabe (Methyl Bromide)	0.0134	mg/Kg	
Unitromethane (methy) Chibride)	< 3.0134	mg/k.g	
Nethylene 1, lunide	0 0134	mg. kg	
, ', L. 1- Feirichlorbethane	4 0 0134	angz≪g	
Tatrachiorostn <b>e</b> ne (PCE)	< 0.0134	mg. kg	
Tans - 1 a - D. Chiprostnens	. 0.0134	<b>#ig</b> 7kg	
t, t, t-Trickioncethane	0.728	mgzkg	
:,.,2-Trichlordethame	( 0.0:34	ជាផ្ទ/សង្គ	
Tricklinostkens (TCE)	0 781	mg. kg	
friculoroflucromethans	√ 0.0÷34	mg/kg	
vinyl Intoride	< 0.0134	mg/Kg	
Solids, Cotal www. ov 📶 💮 🚃 on 08/14/59		3	ta. Mtd. 209
Total Sclids	74 9	%	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281



FILAL MERUAT

This is a final report.

The results have been checked and authorized for release.

عن∡ء

12

GROD BURTANA METALS CORP

Date

08/16/89

(b) (4)

5CM #

00-6471-07

.0-6471-01

P 0.# : Order# -

29266

BUR NUMBER ..

)24155

Date Sampled :

08/02/89

postion.

Date Seceived

08/03/89

Colent 10 🕠

Sampler

est leseriblica

Results units Test Method

Comment. All applicable results for this Bampia reported on dry weight basis

7



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CO BCM Eastern Inc. 1 PLYMOUTH MEETING, PLYMOUTH MEETING, PAN 215-825-3800 PLEASE REMIT CHIEF TO:

FAUE

Date

≞¢M #

P.O.# :

FI AL SUPURE

BUM Humber -

This is a ringe report.

is results have bean checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP.

ATTH: (b) (4)

SCM MALL

324150

40-6471-01

Date Sampled . 08/03/89

Order# 29266

08/16/89

00-6471-07

<u> 2008 tion                                   </u>		Late Received	08/03/89
1tr C		Sampler	ES
Trett Leading tron	4558115	Units	lest Method
(b) (4)			
n revorves			≟PA # 8010
1, 2-2:unicropenzena	: 0.0115	mgz kg	10 mm and all
1.3-D: Oblor Coenzene	0.0115	mgzik <b>g</b>	
:,4-D:cnlcropenzane	( 0.0115	mg/kg	
eromororm 	< 0.01:5	mgzkg	
jarton Tetracalori <b>ce</b>	€ 0.0115	mg/Kg	
UNIDIO DE MIEME	. @ 0115	ngzkg	<b>.</b>
1.promodalonom <b>etrane</b>	0.0113	ក់ផ្ទេកដូច	
afam <b>odichlorometnana</b>	0.0115	ារផ្ទះសត្វ	
jaicroeta <b>ans</b>	s Q.Q115	₩Ġ\kĠ	
ನಿಕ್ಕಾರ <b>ಕನ್ನಡ</b>	C 0.0:15	ng∠kg	
<pre>%; (-E.unicroethane)</pre>	< 0.0115	ភាក្ខុ/×ក្	
n e elenantersethane	√ 0 0:45	ಾಡ್ಡ7⊹ ಡ್ಡ	
n, Absoriorsath <b>ene</b>	0.0115	mg.k <b>q</b>	
a bluntertoropane	0.0115	ាជ្ជ/ៈ ជួ	
1.5-4 G-Dichipropena	< 0 0115	mg/i.g	
vansel, S. Dichioropropana	0.0115	äi <b>g</b> 7⊹.g	2
270mimit And iMethyl Bromide)	0.0115	mg, kg	
Shioromethana (Methyl Onlor)de)	< 0 01:5	mg/kg	1 W.
Metaviene Caloride	. 0.0115	#ag/kg	
, 2, 2-Tetrachlorostnams	< 0.0115	hg/ kg	
Patrachionosthene (PCE)	0.0115	mg/kg	
13.15 B-Lichloroethene	< 0.0115	mg/+ g	4.5
1.1 -Trichloroethane	0.0115	mg∠ kg	
,i-:r:::::::::::::::::::::::::::::::::::	. 0.0115	ang z Kaj	
Trichlorosch <b>ene</b> (TCE)	1 0.0115	mg/kg	
.r.borof.Luoromethane	< 0.0115	mgz k.g	
winy: Inforiae	< 0.0115	ma, ka	
Jolius, Total wy by (b) (4) - 4 on G3/14/39		. ,	Sta. Mtd. 209F
Total Colids	<b>97</b> .:	*	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHEC BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

TRUSH RESURT

This is a rinal report.

the results have been chacked and authorized for relace.

A A GE

CHRISTIANA METALS CORP

Date : 08/16/89

atta: (b) (4)

ECM #

CO-6471-07

BOM MALL 00-0471-01 P 0 # :

Order# : 29266

ES

eda Number

924156

Date Sampled : 08/03/89

CATION

MW-12-1.3

Date Fecelved

08/03/89

litert il

Sambler

set description

R#SUlts

Units Fast Method

Comment. All applicable results for this - Sample reported on ord Weight pasis

-31-



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHESKS TO: 1 PLYMOUTH MEETING. PA 18 215-825-3800

ZIRAL HERUAT

And to a final report.

Tie results have been onecked and authorized for release.

1403

15

CLIENT

LUBISTIANA METALS CORP

- TTT, (b) (4) SOM MALL

30-3471-01

Cate

08/16/89

BCM #

00-3471-07

2 0.⊭

Craer#

29266

BUM RUMBER

224157

.a.w+ :£-7.5

Date Sampled

08/03/89

Date Received

08/03/89 ES

21,4,4		Sampler	ES
ರ ಜ-ಕರ್ಷಕರುಕರಣೆ	M630115	Ja. 13	Test Method
- uniquable Heliodendons by   on caron as			EPA # 8010
:,2-0ithionea <b>chache</b> b	< 0.0124	mg/ Kg	
ese-Decagoropenzene	< 0 0124	mgz/kg	17.0
+,in.cnloropenzane	< 0.0124	mg/kg	
3.comprofm	. 0.0124	mg/kg	
Caroth Tetrachionide	1 0.0124	ATG / K.G	
.retropanzena	0.0124	mazzkg	
@upramophionometh <b>ane</b>	+5:0.0 -	ma, ka	
Bromus: 3/13/17 <b>met/Lane</b>	0.0124	aig/ag	
intorcatuane	< 0.0124	mg. Kg	
Lit Lot though	( 0.0:24	aig7 kg	
1 -D: SAiSraethame	0 0124	mg / K g	
ತ್ತಿದ್ದಿರುವ ಕ್ಷೇಹಿಸಿಕ	. 0.0:24	mgz «g	
, Full-miconductions	1 0.0124	₩ <b>₫.</b> Kg	
, c -c . C 14 3r . or obane	. 0.0:24	ជាថ្នារ ២ ជ	
1:3- :3-Uschichcorodene	. 0.0124	mg∠ka	
cumbro,3:chibroprobena	0.0:24	mg/⊪g	
scombhéiceane (Weinyl Dromiue)	0.0124	mg/kg	
Chichomethane   Wethyl Chichide;	< 0.0124	##ழ்ச்த	
Nachylana Inlovida	< 0 0124	mgzkg	
Tetrioniprostname	4 0.0124	mg/i.g	
(Eineicklundsthame (PCE)	< 0.0124	<b>@g,</b> kg	
nime-1 C-Licatoroatheda	0.0124	aig/1/g	
.t.:-Trichioroethane	< 0.0124	mg/Kg	
C-Tricalorostrame	( Q Q124	mg/kg	
Triumiorcethens (TCE)	0.0136	mg∠kç	
Tric Lurofiluoromethane	< 0.0124	<b>∂ig</b> Zi.g	
v.nyl Inloriae	< 0.0184	ഫ്ളു. ജയ്യ	
331115. Stal W ov ( <mark>b)</mark> - si on 98/14/89			Sta. Mtd. 209F
TIILL SCIIDS	\$୬∵ଚ	4	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 215-825-3800

FAGE

. AL REPORT

This is a final report

The results have been thecked and authorized for release

CHRISTIANA METALS CORP

- TT: (b) (4)

SCAL WALL

30-0+71-31

Cate : 08/16/89

3CM # : 00-6471-07

9.0.#

order# ·

29266

add Number

.i.ent id

924157

 $1W - 1 \pm -7$ 

Date Sampled :

08/03/89

Cate Received

Sampler

08/03/89

Jest Jestraphica

1834115

Units Test Method

Comment - Fil Eppirospie results for this dempla raported on dry weight basis



1850 Gravers Road Norristown, PA 19401 (215) 275-0281 PLEASE REMIT CHEO
BCM Eastern Inc.
1 PLYMOUTH MEETING. PA 19482
215-825-3800

the in a linear deport

The Tesulis have been cheched this authorized for release

CLIENT

IMPISTIANA METALS CORP

(b) (4)

ECSI MALL

20-0471-01

0a.te

14.7

08/16/89

# MOS

00-6471-07

2 Q.#

Orgar* :

29266

Bud Mumber <u>-</u>200<u>-E</u>197

"Dial Schids

924158

*...*⊌- ,2- :5

Date Gampled Gata Received

38/03/89

08/03/89

Eampler

.ist description Results Units Test Method

ರಗ ಚಳುತ್∘ತೇ urguable hardcarpons by . EPA # 8010 3 0:38 ,i-Dismisropenzene ng/kg - G-Granzorabenzene 0.0153 PARKE 1.4-Establorcoenzene < 0.0158 mg, kg 170000°C*# ( 0.0138 mgzikg Carody Tatrachiorias . 0.0153 mg/its initiosenzena V 0.015B ..₫/KĢ Dipromochloromethans 0.0458 ng, Ka srdada.omioromethane ್ ೮.೦೪೭೩ ing / A.g. inioristname 0.0138 mg, kg una er aform 0.0237 前導がおり . 0.0159 i, thuis telepage thank mg/ KQ 0.0 33 und admication thans ារដូវ ១៤ √ 0 ∪ : 3 ភាឌូភា ជួ aigZ+.g ್ತಿ ಎ.ಜೀ ೨೦. ಎರಗರಿವಿತಿಗಳ 0.0::3 < 0.0153 1.5- .3-D.GHieropropens ភាជ្ជា សន្ទ 0.0.53 **30g/kg** #303 1.2-0100100000000000 . 0 0153 Bromethins (Methyl Bromids) marks inidiatelnica (Mathyl Chicride) < 0.0158 aig/i.g Methylene Inlarica . 0.0:23 rag. Kū i, ,i,u-"etrachlordethane . 0.6153 mg/kg Tatracalorosinene PCE. < 0.0153 ಗತ್ತ- ೪೮ Tidho (,5-0.2016) nobethana < 0 0:58 ាងផ្លូវ សត្វ 0.117 i,:, -Tr;c..iorcetname may Ka 0 0 58 aig/rig ThickLordeinene (TIE) 0.753 J.Q . + C inicalons: Lordmethane < 0.0138 mg7KQ agrai magariga < 0.0158 marka 191105. | [[E1 : %] by (b) (4) | on Ga/(4/39 utd. Mtd. 209F

-34-

33.3



1850 Gravers Road Norristown, PA 19401 (215) 275-0281



مخ ريم با

医电线线性 医毒性毒

FRUE is E SUMBL FBASET.

the mostilis have been concored and Authorized for leicase.

CHRISTIANA METALS COAP

ATTN (b) (4)

SCM MALL

00-0471-01

Date . 08/16/89

18

acm #

00-6471-07

P C:#

Order# : 29266

Bank Har bor

924158

Date Sampled : 08/03/89

sample: . ES

Date Redeled : 08/03/89

سد بالتعاشية

محدودات فالمادات

Results UnitS Test Method

lomment -- - approable results for this cample reported in dry weight casis

35 -



1850 Gravers Road Norristown, PA 19401 (215) 275-0281 PLEASE REMIT CHECKS TO BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING. PA 19462 215-82-3800

≆ಷಟ≊

Ĵáte

3CM #

40

08/16/89

00-6471-07

1. mg 1. 2.26 kg/

Tible is a minimum resident.

se listuito care peen consoned and subcorraced for release

CLIENT

LAFISTIANA METALS CORP

ETTAL (b) (4)

20M MARL P 3 # Order# : 29266

 BUX NUMBER
 384159
 Date Sampled
 08/03/89

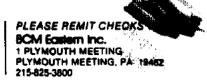
 bulletish
 8-9-1 S
 Cate Received
 08/03/89

12:est 12 Sampler ES

880 000000.0000	200113	Units	Test Method
on (a/ <b>07</b> /s)			EPA # 0010
1.1-0.001070Senzene	. 0.0118	ng/kg	
,a-C.Shiordbenzene	( 0.0113	agzikg	•
1,4-0.chloropenzene	< 0.0118	my≀kg	
Bromoform	< 0.0118	mg/kg	
Carpor Tetrachloride	< 0.0113	mg/kg	
iniorocenzena	5 0. <b>0</b> 118	ដាផ្លូវមជ្ជ	
1.promochiporomethané	< 0 0118	mg/Kg	
gremadicaloromethane	. Ø.214₽	<b>∂g</b> 71.9	
(iniorialmene	0 0118	mg/Ing	
i. Samarann	1. 0.3118	ភាផ្ល√kថ្	
::::-:::::::::::::::::::::::::::::::::	0.9118	<b>mg</b> 7kÿ	
u-ilanianietha <b>ns</b>	< <b>○</b> ○ ○ 12	mazka	
, branced quetaine	- 5 6118	മൂട്ടം പ്രൂ	
1.2-0.drubrauropane	6.0143	mg≠∝g	
<pre>1.3-</pre>	0.0118	mg, F g	
Trans-1 3:0.aalcadoropana	5.0,0118	mg/+.g	
Fromomethane (Methyl Bremile)	. O 0:16	mg≓kg	
Criticamsthame (Methyl Chicates)	0.0119	<b>⊞g/</b> kg	
metrylene Cilorida	0.0119	mg/Kg	
, 1.1.2-Tetraphiorpethane	. 0 0118	mgzkg	
Titrackichostnema (ACE)	0.0113	mg/kg	
Prance (2-0:6:Niordathane	0.ŭ3 <b>6</b> 3	mgz i.g	
: :/ - "f.calcroethane	< 0.0118	mg/Kg	
Trichlordethane	< 0.0118	mazala	
FridLondathana (TCE)	0.0325	mg/kg	
#10x10refluorimethane	0.0115	mg/kg	
vinvi iniorice	0 0118	ing kg	
\$51183, fotal (%) by an us/14/89			31d. Mtd. 209F
Total lolids 0	44 S	•,	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281



FI WE BEFER

TRUE LE LE FILLEL CEDOFT.

The legalis avaices despicastical and authorized for release.

5 AGE

20

CARISTIANA METALS CORF

57... (b) (4)

しひーレキアキーコキ

2 🕠 😩

Oste : 08/16/89

≠ %C

00-6471-07

Order# : 29266

ಕ್ಷಮಾಗ ಸಂಭಾರತಗ ::::n

Tirent in

ಿಕ⊸:59

Date Sampled : 08/03/89

Date Received

08/03/89

Sampler

181 08841.01.16

Results Units Sest Method

lomment. All epolicable results for this simple reported on any weight black



1850 Gravers Road Norristown, PA 19401 (215) 275-0281



Hirac Eliani 1973 - Ilu I. Bi Bapart 1975 - Isbili Mava caan Chedhan Bid Butharizad or Malegas 249E 21

CHENT

CHRISTIANA CHEVALS CORPACTS (b) (4)
SIA CHAEL
CO-6471-01

Date : 08/16/89 SDM # : 00-6471-07 P D.# :

Order# :

29266

الأرابة المحاديان

Data Sampled 08/03/89 - Data Received 08/03/89

5cmq_er

ES

	Scane	201	
edu quez vituan	nt54252	Units	Test Method
- n gassula talocarcons by the sen payoffices			EPA # 8010
Later Aller Colonzone D	0.0117	<b>ភព្</b> ះ អន្	2010
e service do robenzena	. U.0117	ng/kg	i i i i i i i i i i i i i i i i i i i
4-0:chloropenzane	3.0117	mazka	
anomerona	0 0:17	mg/Fg	
jumbor Taineenieriaa	< 0.0117	ma ka	alternative of
.lombosmzene	. 0.0117	alg/kg	
	5 0117	may kg	
eromegic.lorsmet ane	. 9 911 <b>7</b>	mar/ a	
(nicrosthens	0.6117	mg/kg	
	0 0:17	ma/x a	
.:-Cianlorseimana	. 0 0:17	ຫວຸເເຊ	•
J els les rechens	. (147	4-371-3	
. c.,ulondetheme	0.0.7	តាច្នុះកូរ៉េ	
. U-quantono <mark>probana</mark>	0.0117	nigz kig	
1.3- J-Qidkiionophobene	0.91:7	ng, kg	
ralese jūkšionioropropane	C 0.3117	៣៥៤៦៤៤	
Bromomachana Chethyl Bromodor	< 0.0117	mg, ka	
inicromethame (Jethyl Chlomae)	C 0 0 17	aigz i, g	
Neth viane injurice	: 9 91 7	mg/×q	
- 1,4,2-Tetrachiphoethane	· 0 0117	ng/÷ g	
Tutrachianistmana (PCS)	. G 01:7	រ <b>ា</b> ថ្នូវ ៤ថ្ន	
na, z-n, 2-u, chichoroethade	0 0483	mg7+ g	
s sign Trick Lordsthane	1 0.0117	រាធ្វេក សង្	
1.3.1-01.5mlorostname	. 0 0:17	mg/1.g	
"fighlefaethana" (TGE)	0.3117	mg / kilj	
richlorotlucrometheme	1 3 Old 7	mgz:kg	
ANYL LOLETIDE	0.01:0	mg/kg	
801145. ::tal 4/ by (0) (4) on ta/ (4/89)			Sta. Mta. 209F
7313. 3.1.33	3 <b>5</b> 7	7.	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: BCM Gastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

€ز بہ ۔

THE RESIDENCE OF THE SECOND

CLIENT

CHRISTIANA NETALS DIRR

(b) (4)

SOM MALL

10-6-71-61

2416**6** 

12,251 42

300 000000C

ett libterution 

comment. His applicable conducts for this

Lample reported to bid weight bosis

3 JM #

Date : 08/16/89

00-6471-07

ಚರ.೯

Order#

29266

3<u>8</u>

Date Sampled

38/03/89 Cate Received .. 08/03/89

Sampler

ES

Results | Saits Test Method

- 39 -



1850 Gravers Road Norristown, PA 19401 (215) 275-0281 PLEASE REMIT CHECK TO: BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 1946 215-825-3800

% A⊜E

్జులు ఉందారు. అంగ్ కారం కారు ఉంది. కారుండి కారుండి ఉంది. కారు

o habilità lava meen checked and authorized for release.

$\sim$		117
	16	NT

Gu Humbar

i 33<u>t.√a</u>

12.252 ...

CHRISTIANA METALS COSP Cate 08/16/89 3CM (b) (4) 00-6471-07 3 CM: # ា 🕹 🖚 Graer# - 29266 20-0471-01 924:61 Date Sampled 08/03/89 9-0-7 54 Date Federved 08/03/89 Samoler E3

s laster para	kasults	Jnits ta	st Method
	7/49	43	A # 8010
_ outonidoniane	0.9118	ពន្ធរដូច្	
: -u: CnlarabenZene	< 0.0115	ng/kg	"14"
4-Dishidropenzene	· < 0.0115	mg/kg	1994
and notions	< 0.0115	mg/kg	
largom Matropolurid <b>a</b>	0.0115	m <b>a</b> zka	
. Lor (benzona	( 0.0115	ാള/ ഒരു	
jubro, Janiprometoane	. 0.0115	mg, kg	
. Tin hava Julor and Crane	< 0.015	ซอูเ/⊬ g	
19.00most ans	1.0.0115	mg/Rg	
unuar ar ar ar a	v <b>0</b> .0115	ក់ផ្ទ/៤ថ្ន	
d. ing.fiethans	÷ 0.0113	a <b>c</b> γK <b>g</b>	
. L. L. Januar : etatat	. 0.0115	ជាផ្លូវ។ ជួ	
rout lerbet wne	. 0.0115	作品ととは	
. U.C.Lurcorapane	√ 0.0115	भद्राम व	
sa-engn3cTapropena	. 0 0115	mg, kg	
ransk Biblichiurbarobene	√ 0.0115	ភិ <b>រដ្ឋ</b> ភភិទ្ធិ	
acombmet and (Mathyl Bromide)	√ 0.0115	mg i kg	
Plunomathane (Wethyl Chior.de)	0.0115	ngzkg	
(-18) Jane (18207) 38	. 0.0115	m <b>g</b> , Kg	
:2= etrachicrosthane	0.0115	កាញ/ សព្វ	
Natres Lundetheme (PIE)	0.0115	mg/I.g	
provide Eschibroethens	0.220	<b>ጥ</b> ሟን ነ- 3	
Tricklingethane	€ 0.0115	mg/Kg	
, .u-Calculabethane	C 0.0115	ភាព្ទ/ស្ត្	
Tritilitintaineme - TCE:	0.0311	mg/Kg	
Priculant Luarametrane	₹ 0.0:15	ng/kg	
a. Waladaige	: 0.0115	mg / Kg	
mulius, stal 4/ by [   on 63/14-39		<u>ತಿ</u> ್	d. Mtd. 209F
Goral Ducas	83.8	<b>.</b>	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: BCM Eastern Inc.

1 PLYMOUTH MEETING
PLYMOUTH MEETING, PA 1946 215-825-3800

2432

€. 24

RI HE MEBURT

This is a final restry.

Twe results have been insoked and authorited for release

CLIENT

CARISTIANA METALS CORP

; - ; ... (b) (4)

SCAR MALL

**JJ-347**[-Jt

Date

08/15/89

3CM #

00-6471-07

₽ 0.#

Draer# : 29266

Bus dumber . GB4161

Date Sampled :

08/03/89

Sate Received

08/03/89

Sampler

ES

est leseristion

6.19r * ...

Result

Onics Tast Method

Comment. wil applicable results for this

cample reported on any weight basis



1850 Gravers Road Norristown, PA 19401

(215) 275-0281

1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

BCM Eastern Inc.

- A - E

PLEASE REMIT CHECKS TO:

RILL REPORT THE IN E. F. BE VERIOT

The results have user chabites and authorized for release

CLIENT

DARISTIANA METALS CORP

BOM MALL

10-2471-01

Sate

28/16/89

∃CM ÷

00-6471-07

₽ 0.#

ng/ng

mg, kg

mg/kg

mg/Rg

aid Mig. abgr

Order# : 29266

30M Number . 98-162

3-0-13 5

() (2-7/15hiphiphiethame

frightordethene (TCE)

Soling, Josef Har Dy

Total Losses

.r._nluro-luoremethane 93491 (A135138 (b) (4) Cate Sampleo

08/03/89

Cata Secented :

38/03/89

		Late Received	38/03/89
Carena 12		Sampler	: E5
	SSUITS	Units	lest Method
· ·			
-aligespis ಕರ್ಮರ <b>ಿಕ್</b> ರಿಂಗಲಿ ಫ್ಲಾ ರೆಗ ಅಧಿಸರಿಶೀತಿಕ	_		EPA # 8010
t, 1-0: anloropenza :e	( 0.5121	mg, nç	
:,3-0:0:10ncoenzene	< 0.0121	ng⊅kg	
1.4-C.Gnloropenzana	€ 0.0121	mg/Kg	•
3ronoform	0.0121	<i>वा</i> तु∕k वृ	
Carbon Tetrachloride	< 0.0121	mg/Kg	- 4
lklorocenzene .	< 0.0121	aig/⊬g	
Distable Nichieromethane	< 0.0121	mälkä	
Bromodich Lotomatilane	0 0:21	m <b>g</b> /Kg	
Inlordstrage	< 0 0121	ភឌ្ជៈ Kជ្	
ដុស‱ដ្ឋនាស់ស្នា	0.0763	<i>ង</i> <b>ថ្ង</b> ក គ <b>ថ្</b>	
lui-Discilinathata	1 0.0121	mg. Kg	
- Larutoritroethans	. 0 9121	ाषु र स व	
, i wil woroathem <b>e</b>	0.0121	4.2 / 1.2	
t arbidilato <b>propane</b>	0.0121	ಚಿತ್ರ/∓ಲ್ಲಿ	
	. 0.0121	mg/kg	
inans-1 0-010nionopropene	. 0.0121	mg∠⊩g	
Scomphathana (Methy) Dromics)	1 0 0121	wā\#ā	
Inlunomethane (metnyl Chloride)	€ 0.0121	mg/kg	
Math:lasa Chiorid <b>a</b>	2 9.87	<b>ភាព្ទ</b> ា ក <b>ព្</b>	
,2,2-Tatrachloroethama	. 0.0121	*1.ダ/1	
Febraphizordechane 2001	( 0.6121	<b>πg</b> ∴kg	
ThamsO.Chichocheinsma	0.0:82	māv i d	
t, ,, t-injusioneat <b>mana</b>	< 0.0121	mg√kg	

. 0 9121

0.0702

< 0.0121

13:0.0 >

82.6



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS **BCM Eastern Inc.** 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

- ~GE

26

1.00 mus is a sinal report

tia resulta have peen inscred and authorized for release.

CHRISTIANA METALS CORP

ATTN (b) (4)

SCM MALL

00-0471-01

Date : 08/16/89

SCM # : 00-6471-07

⊋ છે.#

Order# 29266

31% Number : 984462

letent Li

Date Sampled .

08/03/89

9-9-10 5

Date Received :

08/03/89

Sampler

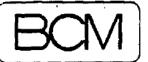
HE. CHEC. PALICA

units Test Mathod

3.1

teins to all spulicable results for this Dempie reported it any weight pasis

-43-



1850 Gravers Road -Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS BCM Eastern Inc.
1 PLYMOUTH MEETING 1 PLYMOUTH MEETING, PA 19462 PLYMOUTH MEETING, PA 19462 244.896.3800 215-825-3800

BACE

ine ide bet and an endertal resort

progults the asem precked and authorized for release.

10-8471-01

Date

08/16/89

3CM #

00-6471-07

P 0.#

Orger#

29266

Elm Number

12.00% 20

464143

THIR BLANK

Date Samples :

08/01/89

Date Rece: ved

Sampler

23

abr . Spiriution		Results	בז גמג	Test Method
Autopas ay (b) (4)	on 38/04/39			EPA # 601
2 2 2 chichicropanzane		1	ug/1	
Dianioropenzene	ý	1	ug/1	
Oranionadalene	•	1	ug/l	A Walland
•	·	1	ug/1	11 4 1 1 4 4 1 4 4 1 4 1 4 1 4 1 4 1 4
uromotorm Carbon Tetrachloride		1	ug/1	1
	``	1	-	
.::lordperzene	į.	1	ug/l	
Pronunct/loremethane	<u> </u>	1	ug/1	
eromodiamioromethana	-	1	ug/1	
<pre>3 niorostnars</pre>	\$	1	ug/1	
LOGE DE DEM	1	1	ug/l	
r, r-blaniardatk <b>ane</b>	<b>&lt;</b>	1	ug/l	
. 2-2011.1001ethane	<	1	ugri	
. Dichizonaethene	4	1	ug/l	
2 Bicalorocrap <b>ane</b>	•	1	ug/I	• •
j.a+k,3-Diq∷lor <b>opropene</b>	4	1	ug/l	
trans-tis-tishipropropene	4	1	ug/1	
indmomethage (Methyl Bromice)	<	1	ug/1	
Juloromethane (Mathyl Chlorida)	<	1	ug/l	
mathylana Cultri <b>da</b>		2.1	ug.1	
,i,2-Tetrachloroethane	€	1	ug/1	
ratrackish pa <b>thana (PCE)</b>	<	1	ug/l	
teds-1.1-1:calsfosthens	•	1	ug/l	
i,i, -injunisceth <b>ane</b>	<	1	ug/l	
1-Thichloroethane	<	1	ug/1	
Thiomistoschene (TCE)	<	1	ug/1	
Vilonioro-luoromethane	<	1	ug/1	
gangi Calbrada		t	ıç, l	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281 PLEASE REMIT CHECKS TO: BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PM 215-825-3800

FAGE

2B

mingu Aspons

This is a final report

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALE CORP Date 08,16/89

300 # 00-6471-07 310 MALL P.O.# 1

30-6471-01 Order# : 29266

Client 10 . Sampler ES

Test Lisaristion	Results	Units	lest Method
Aurgaable Halicardons by U. (b) (4) on 08/07/89			EPA # 501
1,2-Dichioropenzene	< 1	ug/1	July 15
:,3-G:cnloropenzene	( 1	ug/1	77 A
1,4-Dichloropenzana	< 1	ug/1	
Bromoform	< * *	ug/1	
carbon Tatrachloride	< 1 €	ug/l	برق م <u>ار</u> المرابع
Inloremenzane	₹ 1	u <b>g</b> /1	
Dipromochicromethane	( 1	ug/1	
Briomodichiprometh <b>ane</b>	÷ 1	ug/1	
Chiaraethane	s 1	ug/1	•
unitaratorm	< 1	ug/1	
1,1-Cicolorsethane	; 1	ug/1	
,2-Eliniorosinana	€ 1	ug/l	
i,0.daichdath <b>en</b> d	4 1	ug/1	
1,2-Bichloropropane	<b>( 1</b>	ug. 1	
Iss-1.3-Dichloropropene	1	ug/1	
Trans-1.3-D.clorspropene	4 !	<b>ug/1</b>	
Bromomethade (Methyl Bromids)	< 1	ug. 1	•
Uniorchetaese (Wetnyl Caloride)	<b>₹ 1</b>	<b>ug/</b> 1	
Methylana Chiorida	. •	ug. 1	
.,:,∟,2+Tatrachloroethane	i 1	ug/1	
Tetrachicroethene (PCE)	ζ 1	ug/l	
Trans-1.2-bichlordethene	<b>( 1</b>	ug/l	
s, s, :-Trichloroethane	< 1	. ug/1	
1,1,2-Trichilorpathane	1 1	ug.'l	
Triomioroathena (TCI)	₹ 1	ชฐ/1	
Trichitrorluoromethane	< 1	ug/l	
ginyl Colorida	<b>i 1</b>	ag/1	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: BCM Eastern inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19 215-825-3800

TIMAL REPORT This is a final report

The results have been checked and authorized for release.

CLIENT

PAGE

59

CHRISTIANA METALS CORP

ATTN: (D) (4)

BCM MALL

30-3471-01

Date

08/16/89

BCM #

00-6471-07

P.O.#

Order# :

29266

Tagmun NDS LCC**S**T105

924165

FIELD BLANK

Date Sampled

08/03/89

Date Received

08/03/89 TC

Client 10		ampler	ES .
Test Up <b>scription</b>	-esults	Units	Test Method
Furgeacis Halocarpons by (b) (4) on 08/07/89			EPA # 601
1.2-Dichloropenzene	₹ 1	ug/1	
:,3-Dichioropenzene	( 1	ug/l	
1,4-Dichloropenzane	< 1	ug/l	
8romoform	€ 1	ug/l	v 17 Tig
Carton Tetrachloride	₹ 1	- ug/1	
Uniprosenzene	₹ 1	ug/1	
Sibremochloromethane	< 1	ug/1	and Ti
arombalankorometh <b>ane</b>	₹ 1	ug/1	
Ghlardat <b>nane</b>	< 1	ug/1	74
1010forurm	. 1	ug/1	, ;
f, t-utchloroethane	<b>; 1</b>	ug/1	
:.l-Gioniorosthana	€ 1	ug/1	
t,t-Olymisroethene	<b>:</b> 1	ug/l	
:.2-Gionicropropane	4 <b>1</b>	ug/1	
0.3-1,3-Dichloropropene	< 1	ug/1	
Trans-1,3-0:0:10ropropene	€ 1	ug/1	
Bromomathane (Methyl Bromide)	< 1	ug/l	***
Galoromethane (Methyl Caloride)	< 1	ug/1	v1 m-2
Metnylena Chichida	v . •	ug/1	
:,1,2,2-TetrachiorJethane	( 1	ug/1	
Tetrachicroethane (PCE)	< 1	ug/1	
Trans-:,1-Dicalorostnene	< 1	ug/1	
- 1,1,1-Trichloroethane	< 1	ug/1	i de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de l
s,:,i-Tr:chloroethane	( 1	ug/1	
Trichlo/dethene (TGE)	t 1	ug/1	
frichlorofluoromethane	< 1	ug/l	
vinyl Chlorade	< 1	ug/1	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 1 215-825-3800

FIRAL MEFORT

This is a final report.

Tis results have been checked and authorized for release.

CLIENT

PAGE : - 30

CHRISTIANA METALS CORP.

ATTN (b) (4)

SCM MALL

30-6471-01

Date : 08/16/89

3CM # : 00-6471-07

P.Q.# :

Order# : 29266

36M Number

924165

Date Sampled : 08/03/89

LOCATION : FIELD BLANK client io .

Sampler : ES

Date Received : 08/03/89

.est Leschiption

Results Units Test Method

Cartified by

BOM Laboratory Director

LAS CETTIFICATIONS:

FA - 46-507 AL - 40390

4J - 77175

MD - 136

EPA BULK ASSESTES QC - 3339

1



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO BCM Eastern Inc.
1 PLYMOUTH MEETING
PLYMOUTH MEETING, PA 19462 215-825-3800

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

PAGE

Date : 09/01/89

BCM # : 00-6471-01

P.O.# :

Order# : 29596

BCM Number : 926125

CHRISTIANA METALS

Date Sampled : 08/18/89

Location : 8-10-1.5

BCM MALL

00-6471-01

Date Received : 08/18/89

Client ID :

SAMPIET : ES

Test Description	Results	Units	Test Method
Purgeable Halocarbons by (b) (4) on 08/21/89			EPA # 8010
1,2-Dichlorobenzene	< 0.0117	mg/kg	
1,3-Dichloropenzene	< 0.0117	mg/kg	
1,4-Dichloropenzene	< 0.0117	mg/kg	
Bromoform	< 0.0117	mg/kg	
Carbon Tetrachloride	< 0.0117	mg/kg	
Chlorobenzene	< 0.0117	ma/ka	
Dibromocnloromethane	< Q.0117	ma/ka	
Bromodichloromethane	< 0.0117	mg/kg	
Chlorostnane	< 0.0117	mg/kg	
Chloroform	< 0.0117	mg/kg	
1,1-Dichlorosthane	< 0.0117	mg/kg	
1,2-Dichlorosthane	< 0.0117	mg/kg	
1,1-D:chloroethene	< Q.Q117	mg/kg	
1,2-Dichloropropane	< 0.0117	mg/kg	
Cis-1,3-Dichloropropene	< 0.0117	mg/kg	
Trans-1,3-Dichloropropene	< 0.0117	mg/kg	
Bromomethane (Methyl Bromide)	< 0.0117	mg/kg	
Chloromethane (Methyl Chloride)	< 0.0117	mg/kg	
Methylene Chloride	< 0.0117	mg/kg	
1,1,2,2-Tetrachloroethane	< 0.0117	mg/kg	
Tetrachloroethene (PCE)	< 0.0117	mg/kg	
Trans-1,2-Dichlorosthene	< 0.0117	mg/kg	
1,1,1-Trichloroethane	< 0.0117	mg/kg	
1,1,2-Trichloroethane	< 0.0117	mg/kg	
Trichloroethene (TCE)	1.03	mg/kg	
Trichlorofluoromethane	< 0.0117	mg/kg	
Vinyl Chloride	< 0.0117	mg/kg	
Solids, Total (%) by (0)(4) on 08/30/89			Std. Mtd. 209F
Total Soligs	85.5	*	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO SCM Scattern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

FINAL REPORT

PAGE

2

This is a final report.

The results have been checked and authorized for release.

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Date . 09/01/89

BCM # : 00-6471-01

P.O.# :

Order# : 29596

BCM Number : 926125

Client ID :

Location : 8-10-1.5

Date Sampled . 08/18/89

Date Received : 08/18/89

1 100 mg

--- Wara

Sampler

Test Description

Results

Units Test Method

Comment: All applicable results for this

sample reported on dry weight basis



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT C...
BCM Eastern Inc.
1 PLYMOUTH MEETING
PLYMOUTH MEETING, PA 18462
215-825-3800 215-825-3800

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: JA(b) (4)

BCM MALL

00-6471-01

Date : 09/01/89

BCM # : 00-6471-01

P.O.# :

PAGE

Order# : 29596

BCM Number : 926126

Date Sampled : 08/18/89

Location : 8-10-6.5

Date Received : 08/18/89

Client ID :

Sampler : Es

CITCHE ID .	34	mb to i	. 20
Test Description	Aesults	Units	Test Method
Purgeable Halocarbons by (b) (4) on 08/21/89			EPA # 8010
1,2-Dichlorobenzene	< 0.0116	mg/kg	
1,3-Dichlorobenzene	< 0.0116	mg/kg	•.
1,4-Dichlorobenzene	< 0.0116	mg/kg	•
Bromoform	< 0.0116	mg/kg	
Carbon Tetrachloride	< 0.0116	mg/kg	
Chlorobenzene	< 0.0116	mg/kg	
Dibromochloromethane	< 0.0116	mg/kg	
Bromodichloromethane	< 0.0116	mg/kg	
Chloroethane	< 0.0116	mg/kg	
Chloroform	< 0.0116	mg/kg	
1,1-Dichlorostname	₹ 0.0116	mg/kg	•
1,2-Dichlorosthans	< 0.0116	mg/kg	
1,1-Dichlorosthens	< 0.0116	mg/kg	
1,2-Dichloroprop <b>ane</b>	< 0.0116	mg/kg	
Cis-1,3-Dichloropropene	< 0.0116	mg/kg	
Trans-1,3-Dichloropropens	< 0.0116	mg/kg	•
Bromomethane (Methyl Bromide)	< 0.0116	mg/kg	
Chloromethane (Methyl Chloride)	< 0.0116	mg/kg	
Methylene Chloride	< 0.0116	mg/kg	
1,1,2,2-Tetrachloroethane	< 0.0116	mg/kg	
Tetrachloroethene (PCE)	< 0.0116	mg/kg	
Trans-1,2-Dichloroethene	< 0.0116	mg/kg	
1,1,1-Trichlorosthane	< 0.0116	mg/kg	
1,1,2-Trichloroethane	< 0.0116	mg/kg	
Trichloroethene (TCE)	< 0.0116	mg/kg	
Trichlorofluoromethane	< 0.0116	mg/kg	
Vinyl Chloride	< 0.0116	mg/kg	
Solids, Total (%) by (b) (4) on 08/30/89			Std. Mtd. 209F
Total Solids	86.1	*	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: **BCM Eastern Inc.** 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

PAGE :

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Date 09/01/89

BCM # : 00-6471-01

P.O.# :

Order# :

BCM Number : 926128

Client ID

Location : 8-11-65

Date Sampled : 08/18/89

Date Received :

08/18/89

Test Description	Results	Units	Test Method
Purgeable Halocarbons by (b) (4) on 08/21/89			EPA # 8010
1,2-Dichloropenzene	< 1.18	mg/kg	
1,3-Dichlorobenzene	< 1.18	mg/kg	معرف المنطق المنطق المنطق المنطق المنطق المنطق المنطق المنطق المنطق المنطق المنطق المنطق المنطق المنطق المنطق المنطق المنطق
1,4-Dichlorobenzene	< 1.18	mg/kg	Mer.
Bromoform	< 1.18	mg/kg	
Carbon Tetrachloride	< 1.18	mg/kg	
Chlorobenzene	< 1.18	mg/kg	
Dibromochloromethane	₹ 1.18	mg/kg	
Bromodichloromethane	< 1.18	mg/kg	
Chloroethane	< 1.18	ma/ka	P · .
Chloroform	< 1.18	mg/kg	
1.1-Dichlorosthane	( 1.18	mg/kg	
1,2-Dichloroethane	. < 1.18	mg/kg	
1,1-Dichloroethene	39.8	mg/kg	
1,2-Dichloropropane	₹ 1.18	mg/kg	
Cis-1,3-Dichloropropene	<b>C 1.18</b>	mg/kg	
Trans-1,3-Dichloropropene	< 1.18	mg/kg	
Bromomethane (Methyl Bromide)	< 1.18	mg/kg	
Chloromethane (Methyl Chloride)	< 1.18 ⋅	mg/kg	
Methylene Chloride	1.44	mg/kg	
1,1,2,2-Tetrachloroethane	< 1.18	mg/kg	
Tetracnloroethene (PCE)	10.2	mg/kg	· . · · · ·
Trans-1,2-Dichloroathene	< 1.18	mg/kg	,
1,1,1-Trichloroethane	36.0	mg/kg	200
1,1,2-Trichloroethane	₹ 1.18	mg/kg	
Trichloroethene (TCE)	3280	mg/kg	
Trichlorofluoromethane	< 1.18	mg/kg	
Vinyl Chloride	< 1.18	mg/kg	
Solids, Total (%) by (b) (4) on 08/30/89			Sta. Mta. 2096
Total Solids	84.5	*	
TOTAL SOLIUS	84.5	76	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: BCM Eastern Inc. ... 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

PAGE



FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL 00-6471-01 BCM #

Date

١

09/01/89 00-6471-01

P.O.# :

Order# :

BCM Number : 926128 Location

Client ID

Date Sampled :

08/18/89

1350

- 1-71 j

: B-11-65

Date Received : Sampler

08/18/89

Test Description

Results

Units Test Method

Comment: All applicable results for this sample reported on dry weight basis



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: BCM Bastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

PAGE

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

09/01/89

BCM # : 00-6471-01

P.O.# Order# :

29596

BCM Number : 926129

Date Sampled :

08/18/89

: 8-12-4.5

Date Received :

08/18/89

Location Client ID :

Test Description	Results	Units	Test Method
Purgeable Halocarbons (b) (4) on 08/21/89			EPA # 8010
1,2-Dichlorobenzene	( 1.15	mg/kg	
1,3-Dichlorobenzene	< 1.15	mg/kg	
1,4-Dichlorobenzene	C 1.15	mg/kg	
Bromoform	< 1.15	mg/kg	
Carbon Tetrachloride	₹ 1.15	mg/kg	
Chlorobenzene	< 1.15	mg/kg	
Dibromochloromethane	< 1.15	mg/kg	
Bromodichloromethane	< 1.15	mg/kg	
Chlorosthane	< 1.15	mg/kg	
Chloroform	< 1.15	mg/kg	
1,1-Dichloroethane	< 1.15	mg/kg	
1,2-Dichloroethane	< 1.15	mg/kg	
1,1-Dichloroethene	( 1.15	mg/kg	
1,2-Dichloropropane	< 1.15	mg/kg	
Cis-1,3-Dichloropropene	< 1.15	mg/kg	
Trans-1,3-Dichloropropene	< 1.15	mg/kg	
Bromomethane (Methyl Bromide)	< 1.15	mg/kg	
Chloromethane (Methyl Chloride)	< 1.15	mg/kg	
Methylene Chloride	< 1.15	mg/kg	
1,1,2,2-Tetrachloroethane	< 1.15	mg/kg	
Tetrachloroethene (PCE)	< 1.15	mg/kg	
Trans-1,2-Dichloroathene	< 1.15	mg/kg	
1,1,1-Tricnloroethane	< 1.15	mg/kg	
1,1,2-Trichloroethane	< 1.15	mg/kg	•
Trichloroethene (TCE)	157	mg/kg	
Trichlorofluoromethène	< 1.15	mg/kg	
Vinyl Chloride	₹ 1.15	mg/kg	
Solids, Total (%) by (b) (4) on 08/30/89		- <b>-</b>	Std. Mtd. 209F
Total Solids	87.1	*	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

!! PLEASE REMIT CHECKS TO: BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 1940 215-625-3800

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Order# :

: 09/01/89

00-6471-01 BCM # :

10

P.O.# :

PAGE

29596

BCM Number : 926129

Date Sampled : 08/18/89

~ ×

7.7.7.7.

Location : 8-12-4,5

Date Received : Sampler

08/18/89

Client ID :

Test Description

Results

Units Test Method

Comment: All applicable results for this sample reported on dry weight basis



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: BCM Eastern Inc.: 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

PAGE

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS

ATTN:  $J_{(b)}(4)$ 

BCM MALL

00-6471-01

BCM #

00-6471-01

P.O.#

Order# :

BCM Number : Location

926130

8-12-6.5

Date Sampled : Date Received :

08/18/89

08/18/89

Client ID

sampler

	52.	<b></b>	
Test Description	Results	Units	Test Method
Purgeable Halocarpons by (b) (4) on 08/21/89			EPA # 8010
1,2-Dichlorobenzene	< 0.0605	mg/kg	EPA W DOID
1.3-Dichlorobenzene	( 0.0605	mg/kg	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1,4-Dichlorobenzene	⟨ 0.0605	mg/kg	
Bromoform	⟨ 0.0605	mg/kg	
Carbon Tetrachloride	< 0.0605	mg/kg	e man e la companya e 🌬
Chlorobenzene	( 0.0605	ma/ka	
Dipromochloromethane	< 0.0605	ma/ka	•
Bromodichloromethane	( 0.0605	mg/kg	
Chloroetnane	( 0.0605	mg/kg	
Chloroform	⟨ 0.0605	ma/ka	
1,1-Dichloroethane	< 0.0605	mg/kg	
1,2-Dichlorosthane	< 0.0605	mg/kg	
1,1-Dichloroethene	( 0.0605	ma/ka	
1,2-Dichloropropane	< 0.0605	mg/kg	
Cis-1,3-Dichloropropene	( 0.0605	mg/kg	
Trans-1,3-Dichloropropene	< 0.0605	mg/kg	
Bromomethane (Methyl Bromide)	< 0.0605	mg/kg	
Chloromethane (Methyl Chloride)	< 0.0605	mg/kg	÷
Methylene Chloride	0.357	mg/kg	•
1,1,2,2-Tetrachloroethane	< 0.0605	mg/kg	
Tetrachloroethene (PCE)	< 0.0605	mg/kg	
Trans-1,2-Dichloroethene	< 0.0605	mg/kg	,
1,1,1-Trichloroethane	< 0.0605	mg/kg	, r
1,1,2-Trichloroethane	< 0.0605	mg/kg	
Trichloroethene (TCE)	6.99	mg/kg	
Trichlorofluoromethane	< 0.0605	mg/kg	
Vinyl Chloride	< 0.0605	ing/kg	
Solids, Total (%) by L. JOHNSON on 08/30/89		- <b>-</b>	Std. Mtd. 209F
Total Solids	82.7	*	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: I PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

PAGE

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

09/01/89

BCM # :

00-6471-01

P.O.# :

Order# : 29596

BCM Number : 926130

Client ID

Location : B-12-6.5 Date Sampled :

08/18/89

Date Received :

08/18/89

Sampler

Test Description

. Results

Units Test Method

Comment: All applicable results for this sample reported on dry weight basis



### BCM Laboratory Division Francis

1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 PLYMOUT.... 215-825-3800

PAGE

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Order# : 29596

09/01/89

SCM # : 00-6471-01

P.O.# :

BCM Number : 926131

Client ID :

Location : TRIP BLANK

Date Sampled : 08/17/89

Date Received : 08/18/89

Sampler :

Test Description		Results	Units	Test Method
Purgeable Halocarbons by (b) (4):	on 08/21/89			EPA # 601
1,2-Dichloropenzene		< 1	ug/l	
t,3-Dichlorobenzane		<b>&lt; 1</b>	ug/l	
1,4-Dichlorobenzene		< 1	ug/l	
Bromoform		< 1	ug/l	
Carbon Tetrachloride		< 1	ug/1	
Chlorobenzene		<b>&lt; 1</b>	ug/1	• • •
Dibromochloromethane		< 1	ug/l	
Bromodichloromethane		<b>&lt; 1</b>	ug/l	
Cnloroetname		< 1	ug/l	
Chloroform		< 1	ug/l	
1,1-Dichloroethane		< 1	ug/l	
1,2-Dichloroethane		< 1	ug/l	
1,1-Dichloroethene		<b>〈</b> 1	ug/l	
1,2-Dichloropropane		< 1	ug/1	
Cis-1,3-Dichloropropene		<b>( 1</b>	ug/l	
Trans-1,3-Dichloropropene		<b>&lt; 1</b>	ug/l	
Bromomethane (Methyl Bromide)		<b>&lt; 1</b>	ug/l	
Chloromethane (Methyl Chloride)		< 1	ug/l	
Methylene Chloride		< 1	ug/l	
1,1,2,2-Tetrachloroethane		<b>&lt; 1</b>	ug/1	
Tetrachloroethene (PCE)		< 1	ug/l	
Trans-1,2-Dichloroethene		<b>(1</b>	ug/l	
1,1,1-Trichloroethane		< 1	ug/l	
1,1,2-Trichloroethane		<b>( 1</b>	ug/l	
Trichloroethene (TCE)		< 1	ug/l	
Trichlorofluoromethane		< 1	ug/l	
Vinyl Chloride		< 1	ug/l	



### BCM Laboratory Division Barrier

1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: 8CM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19482 215-825-3800

PAGE

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BÇM MALL

00-6471-01

Order# :

09/01/89

P.Q.# :

Date :

BCM # : 00-6471-01

29596

44.

BCM Number : 926132

Date Sampled : 08/17/89

Location : FIELD BLANK Client ID

Date Received : 08/18/89

Test Description	Results	Units	Test Method
Purgeable Halocarbons by (b) (4) on 08/21	/89		EPA # 601
1,2-Dichlorobenzene	<b>( 1</b>	ug/1	•
1,3-Dichlorobenzene	<b>&lt; 1</b>	ug/l	4 A
1,4-Dichloropenzene	< 1	ug/l	A security
Bromoform	<b>&lt; 1</b>	ug/l	
Carbon Tetrachloride	< 1	ug/l	The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon
Chloropenzene	<b>&lt; 1</b>	ug/1	
Dibromochloromethane	< 1	ug/1	
Bromodichloromethane	<b>&lt; 1</b>	ug/l	
Chloroethane	< 1	ug/l	
Chloroform	< 1	ug/1	•
i, t-Dichlorosthane	<b>₹ 1</b>	ug/l	
1,2-Dichloroethane	<b>&lt; 1</b>	ug/l	
i,i-Dichloroethene	< 1	ug/l	
1,2-Dichloropropane	< 1	ug/l	
Cis-1,3-Dichloropropene	< 1	ug/1	
Trans-1,3-Dichloropropene	<b>&lt;</b> 1	ug/I	
Bromomethane (Methyl Bromide)	< 1	ug/1	
Chloromethane (Methyl Chloride)	< 1	ug/l	• •
Methylene Chloride	< 1	<b>ug/</b> 1	0.*
1,1,2,2-Tetrachloroethane	< 1	ug/1	
Tetrachloroethene (PCE)	< 1	ug/l	
Trans-1,2-Dichloroethene	< 1	ug/l	
1,1,1-Trichloroethane	< 1	ug/l	
1,1,2-Trichloroethane	< 1	ug/l	
Trichloroethene (TCE)	< 1	ug/l	
Trichlorofluoromethane	€ 1	ug/l	
Vinyl Chloride	< 1	ug/l	



(215) 275-0281

BCM Laboratory Division

1850 Gravers Road

Norristown, PA 19401
(215) 275-0281

PLEASE REMIT CHECKS TO:

BCM Eastern Inc.

1 PLYMOUTH MEETING, PA 19401
215-825-3800

PAGE

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

АТТИ: J(b) (4)

BCM MALL

00-6471-01

Date

09/01/89

BCM # : 00-6471-01

P.O.# :

Order# : 29596

BCM Number : 926132

Location : FIELD BLANK

Date Sampled : 08/17/89

8 7.4

----

Sampler

Date Received : 08/18/89

Client ID :

Test Description

Results

Units Test Method

Certified by :

BUM LEDUTATORY DIFECTOR

Lab Certifications:

PA - 46-007 AL - 40300

NJ - 77175

MD - 136

EPA BULK ASBESTOS QC - 3339

1



1850 Gravers Road: 100 Norristown, PA 19401 (215) 275-0281

This is a final raport

THE results have been checked and authorized for release





CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

50-6471-61

pate

09/22/89

ECM #

00-6471-01

P.G.#

0/08:# :

29800

Bun Lumper <u>Location</u>

y27566

20世 - 1

Client 10 : UNFILTERED

Date Sampled :

08/29/89

Date Received

08/29/89

			عَادِينَ عَيْقِ وَلِمُ مُنْ مَا رَبِّ اللَّهِ فَي مَا رَبِّ اللَّهِ فَي مَا رَبِّ اللَّهِ فَي مَا رَبِّ اللَّ
Tast Description	Results	Units	Test Method
purgeable Hallcarbons by (b) (4) on 10705789			EPA # 8010
1.E-Uschipropenzene	< t	ug/1	
1/d-Didhiorsoenzane	<b>: 1</b>	ug/1	
:.+-Cloniorocenzene	<b>4 1</b>	ug/1	اند. ما القلامات ال
Bromotorm	< 1	ug/1	
Carbon (etrachioride	< 1	ug/1	
Chlorocenzene	< <b>1</b>	ug/1	10 m 10 m 10 m 10 m 10 m 10 m 10 m 10 m
<u> </u>	₹ 1	ug/1	
@fonca:chlo:omethane	< 1	ug/1	
ordstname	4 1	u <b>g/1</b>	
Chlaratorm	; <b>1</b>	ug/1	
t,1-dicalorostasas	s 1	ug/1	
1.d-Dichicrostnans	<b>4</b> 1	ug/1	
t,t-bioniprostnens	€ 1	ug/1	
1, L-Blonieropropane	4 <b>1</b>	ug/1	
las-:.s-Dainlonopropane	s 1	ug/1	
frans-1,2-Dichipropropene	€ 1	ug/1	
aromomethane Methyl Bromide,	< 1	ug/1	
Chicromethane (Methyl Chicride)	<b>( 1</b>	ug/l	
methylane Chioride	< 1	ug/l	
1,1,2,2-Tetrachloroethane	( 1	ug/1	
Tetrachionosthame (PCE)	< t	ug/1	
Trans-1,2-Dichloroethene	₹ 1	uç.1	
tyty:-:richipfoethame	< t	ug/l	
1.1.2-Trickloroethane	< 1	ug/1	10 kg 30 cm
Trichloroethene (TCE)	< 1	ug/l	*.
Trichlorofluoromethane	< 1	ug/l	
Vinyl Unlaride	< 1	u <b>g</b> /1	
Figuriae by J. FickE on 09/07/89			EPA # 340.2
Fluorice	< 0.1	m <b>g</b> /1	•
NITTATE AS N by J. SUTHERLAND on 09/05/39			EPA# 353.2



1850 Gravers Road . Norristown, PA 19401 (215) 275-0281

A INAL NEEDERT

This is a final report.

ind lesurts have been checked and authorized for release





CLIENT

CHRISTIANA METALS JORP

Date :

99/22/89

3CM # :

J0-6471-01

P.Q.#

Order# :

29800

. nedmun Müa

127536

3CM Mall

00-6-71-01

Cate Sampled :

98/29/89

Location : Mw-1

Cate Received :

08/29/89

client ID . UNFILTERED

Test Description	5esults	Units	Test Method
CATCATS 55 A	3.789	mg/l	
pH - Field by M FIBH on 08/30/89 pH-Field	5 93	Sta.Un	EPA # 150.1
Spacific Conductance - Field by M. FISH on 08/30/89 Specific Conductance(umnos/cm 025 Deg C)	95	umnos	EPA #120.1



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FINAL REPURT

This is a final report.

The results have been checked and authorized for release.

PAGE

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BOM MALL

60-6471-01

Date : BCM #

09/22/89

P.O #

00-6471-01

Orger# :

29800

BEM Number :

927567

Location : WW-4

Client ID

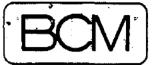
UNFILTERED

Date Sampled :

08/29/89

Date Rece: ved : 08/29/89

Test lescription	Results	Units	Test Method
Purgeable Helocarpons by (b) (4) on 09/03,80			EPA # 8010
1,2-Dichloropanzene	<b>∢</b> :	ug/1	
1 3-0.chlorotenzene	C 1	ug/1	
:,4-0:bnioropanzana	< 1	ug/1	
Bromo form	< 1	ug/1	
Carcon Tetrachioride	< 1	ug/1	
Cnloro <b>cenzene</b>	< 1	ug/l	e a change of the control of the
	( 1	ug/1	a wee
gromosicaloromathene	< 1	ug/1	14
Chicrosthane	< 1	ug/1	,
Chioroform	< 1	ug/1	
t, t-Bichloroethane	11 2	ug/1	: -
s,2-Ciciloroethane	. 1	ug/1	
:.:-Cichiorostnene	5.5	ug/l	
1,C-3.Ghloropropane	< :	ug/1	
0.3-1,3-0:Chloropropene	\$ 1	ug/_	
Trans-1,3-0:enloropropene	< 1	ug/l	
erchomethane (Methyl Bromise)	<b>: 1</b>	ug/1	
Chloromethane (Methyl Chloride)	s. 1	ug/1	
Mathylana Uniorida	< 1	ug/i	
1,1,2,2-Tetrachloroethane	SEŽ PCE		
Tetrachioroginene (PCE)	24.9	ug/1	
Trans-1,2-Dichicroethene	316	ug/1	
:,:,:-Trichlordethane	18.⊋	ug/1	
1,:,2-frichloroethane	₹ 1	ug/1	
Trianlardeinene (TCE)	1110	<b>내</b> 다 기	
Tricklorofluoromethane	<b>&lt; 1</b>	ug/1	
vinyl Inloride	<b>42</b> . 2	ug/1	
Fluaride by J. FICKE on 09/07/89			EPA # 340.2
fluorige	14.1	mg/1	
Nitrate as N by ( on 09/05/89			EPA# 353.2



### BCM Laboratory Division Zamas ...

1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FIRML NEPURY

This is a final report.

The results have been chacked and authorized for release.

PAGE



CLIENT

CHRISTIANA METALS CORP

ATTN - (b) (4)

BCM MALL

20-6471-31

Date

09/22/89

3CM # . P 0.# 00-6471-01

Order# :

29800

BCM Number

927567

Location

MW - 4

Client 15 :

UNFILTERED

Date Sampled :

08/29/89

Date Received :

08/29/89

, 't., .

Test Esscription	Sesults -	Units Test Method
****/=:3	7.13	mg/l
рм - Fislu Ly A - S <mark>(b) (4)</mark> — on 08/29/80		EPA # 150.1
ph-ridid	6 28	sta.Un
Specific Conductance - Field by (	on 08/29/89	EFA #120.1
Epacific Conductance(Amnos/cm #25 Dec C)	500	Emhos



### BCM Laboratory Division 1850 Gravers Road

Norristown, PA 19401 (215) 275-0281

FINAL PERCAT

lois is a minai report.

The recults wave been onacked and authorized for release.



PAGE

CLIENT

CHAISTIANA METALS CORP

ATTN: (b) (4)

BUM MALL

60-5471-01

Grøer# ·

Date

09/22/89

BCW # :

00-6471-01

o.c.# :

29800

Bud Gumber

927568

Location : MW-5 Client 15 : UNFILTERED

Date Sampled :

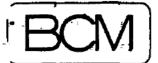
08/29/89

Date Received :

08/29/89

**Bampler** 

			* *
Test Description	Sesulta	units	Test Method
Pungsablo Haissarbons by U STOUDT on 09/05/	9¢		EPA # 8010
1.2-Jichiorobenzene	∢ 1	-g/1	
1 3-Escalaropenzene	<b>&lt; 1</b>	UQ/1	
1.4-Dichioropenzane	C 1	ug/1	17.04
8romoform	< 1	ug/1	1. 16
Carpon Tetrachionide	ፈ 1	ug/1	97/
Chloropenzene	<b>( 1</b>	ug/1	- The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec
diatomochicrometh <b>ane</b>	₹ 1	ug/1	April 12
Bromodicaloremethane	< 1	ug, 1	
uniordethane	3.3	<b>3Q</b> /1	
Chloroform	< 1	ug/1	
(.t-U.Snloroethane	16.5	ug/.	
1,3-0.chicrostm <b>ane</b>	<b>〈 1</b>	Ug/1	* .
1.1-E:caloroetheme	< 1	ug/l	
i, d-Elenteropropane	₹ 1	ug/1	
U.S-:.3-8:2n_oropropene	<b>4 1</b>	ug/.	
Trans-1,3-D:cnloropropene	× 1	ug. 1	
Bromomethane (Aethyl Sromide)	₹ 1	10/7	
Chioromethana (Methyl Chioride)	<b>i</b> 1	ug/1	
Methylene Chiorice	< 1	ug/l	
1,1,2,2-Tecrainloroethane	€ 1	ug/l	
Tatrachiordathana (PCE)	<b>( 1</b>	ug/1	,
Trans-1,2-Dichlorostnens	18.5	ug/1	
i,i,i-,rianiorcethane	< 1	ug/l	
tur,u-Trichlordathana	< 1	ug/1	.t)
Trianiaraethene (TCE)	< 1	ug/l	
Triciloroficoromethane	< 1	ug/1	
vinyl Chiorica	4.2	ug/1	
140%162 by J <mark>(b)(4) on 09/07/89</mark>			EPA # 340.2
Fluoride	9 56	mg/l	
Nitrate 33 H by (b) (4) on 09/21/89			EPA# 353.2



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FINAL REFURT

This is a final report.

The results have been checked and authorized for release.

PAGE



CLIENT

CHRISTIANA METALS CORP.

ATTH. (b) (4)

Specific Conductance (umnos/cm #25 Deg C)

30-6471-01

Date : 09/22/89

umbos

BCM # : 00-6471-01

P.O.# :

Order# : 29800

80% Numper - 927568

Location . Mw-5

client ID . UNFILTERED

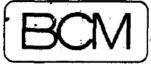
Date Sampled 08/29/89

Date Received : 08/29/89

Sampler :

Tast Description	Results	Units	Test Method
Gittate as W	0 099	mg/l	
pH - Field by A. (b) (4) on 08/29/89			EPA # 150.1
pH~Field Specific Conquotancs - Field by A. (b) (4)	6.62 on 06/29/89	std.un	EPA #120.1

4600



### BCM Laboratory Division Fig. 4.4.

Norristown, PA 19401 (215) 275-0281

FIRAL REPORT

Tols is A limal report.

The results have been checked and authorized for release



PAGE

CLIENT

CHRISTIANA METALS CORP.

ATTN: (b) (4)

BOW WALL

JG-6471-61

Date : 09/22/89

BCM # 00-6471-01

P.O.# .

Order# : 29800

BCM Number : 927569

Location .

MW = 6

Client ID - UNFILTERED

Date Sampled : 08/29/89

Date Received : 08/29/89

Sampler : BM

Test Description	Results	Un: t3	Test Method
Purgaable Halocarbons by			EPA # 3010
1.2-Dichlorcoenzene	( 1	ug/l	
1,3-31chloropanzene	; 1	ug/1	
t,4-D.chloropanzane	< 1	ug/1	
Bromoform	< 1	ug/1	
Cardon Tetrachlorida	< 1	ug/1	. 1.
Chioropanzana	< 1	ug/1	ر میں میں اس میں اس میں اس میں اس میں اس میں اس میں اس میں اس میں اس میں اس میں اس میں اس میں اس میں اس میں اس اس میں اس می
Discomponitrana	< 1	ug/1	
Bromodicalgromethane	< 1	ug/l	
Chioroethane	₹ 1	ug/1	
Chlorotorm	<b>: 1</b>	ug/l	
1,1-01cmlorostname	9 <b>9</b>	uq/1	
1,2-Dichloroethane	< 1	ug/1	
1,1-E:calorostnens	ნ. 5	ug/l	
1,2-Dichloropropane	< 1	ug/l	
Gis-1.3-Dichioropropena	€ 1	ug/1	
Trans-1,1-Dichipropropane	< :	ug/l	
Bromomethane (Methyl Bromide)	€ 1	ug/l	
Chicromethana (Methyl Inlorade)	<b>&lt; 1</b>	ug/1	
Methylene Chioride	< 1	ロダノン	
1,1,2,2-Tetracaloroethane	4. 1	ug/l	10,
Tatrachicrusthena (ACE)	₹ 1	ug/1	
Trans-1,3-0:chloroethene	82.4	u <b>g/</b> 1	
i, i, i-Trianiorsethane	70.1	ug/1	
t, t, 2-Trionloroethane	< →	ug/l	
Tr.cnloroethene (TCE)	526	ug/l	
Trichlorofluoromethane	< 1	ug/1	
Vinyl Onloride	8.7	ug/1	
fluoride by J. FICKE on 09/07/89			EPA # 340.2
Fluorice	8.02	mg/l	
Nicrate as n by (b) (4) on 09/05/89			EPA# 353.2



## BCM Laboratory Division 1850 Gravers Road

Norristown, PA 19401 (215) 275-0281

PAGE :



FINAL AEPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN. (b) (4) BCM MALL

30-0471-01

Data : 09/22/89

P.O.# :

3CM # : 00-6471-01

Order# : 29800

BOM Number ...

927569

LUCATION : MW-6

Client ID . UNFILTERED

Date Sampled :

08/29/89

Date Received : 08/29/89

Test Description	Results	Units	Test Method
with as as a	1.67	mg/1	
ph - Field by (0)(4) on 08/29/39			EPA # 150.1
рн-F.813	5.58	Sta. Un	. h
Specific Conductance - Field by	on 08/29/89		EPA #120.1
Specific Conductance (umhos/cm \$25 Deg C)	710	umnos	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FAGE

FINAL PEPCAT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

ECM MALL

30-6471-31

BCM #

09/22/89

P C.# :

Date

00-6471-01

Order#

29800

BUM NUMBER : Location :

927570

Mw-7

Client LD : UNFILTERED

Late Samples :

1 08/29/89

Date Received :

08/29/89

·		,	
Test Description	Results	Units	Test Method
рагдыврые наіссагропь by U (b)(4)т эл 39705, 89			EPA # 8010
E-D:Chibropenzene .	<b>( 1</b>	ug/1	
1,3-Dichlorobenzane	< 1	ug/1	a a sagarah a
1,4-5.inioropenzene	₹ 1	ug/1	e e e e e e e e e e e e e e e e e e e
Bremeform	< 1	ug/1	
Carpon Tetrachloride	<b>&lt;</b> •	ug/l	44. EW
Chioropenzane	<b>₹ 1</b>	ug/1	The Late
dipromochipromethane	<b>₹</b> 1	ug/1	
Bromos:cnloromethane	< 1	ug/1	:
Unitorcethane	<b>ፈ 1</b>	ug/1	
Coloraform	< 1	ug/1	
:,t-Sickiproetheme	1 3	ug/1	
1,2-2.chicroathana	i 1	ug/1	
1,1-01Chloroetheme	< 1	ug/1	
1,2-1.cnloropropane	₹ 1	ug/1	
Gia-1,5-Gignioropropene	<b>4 1</b>	ug/1	
Tranu-1,3-01cmloropropene	<b>3.1</b>	ug/l	
erumumathana (wethy) aromide)	< 1	ug/1	
Caloromethade (Methyl Chioride)	<b>( 1</b>	ug/l	
Methylene Chioride	< 1	ug/l	
1.1.2.2-Tatrachloroathane	<b>&lt; 1</b>	ug/l	****
Tetrachichoethene (FCE)	₹. 1	<b>내</b> 었기고	
Trans-1,2-Dichloroethene	49.3	ug/1	
:,:, -:::anioroetaane	2.5	ug/1	
1,2,2-Tricalorostmans .	<b>&lt; 1</b>	uç/1	
Trichlordethene (TCE)	78.9	ug/1	¥*
Trichlorofluoromethane	< 1	ug/l	
Vin-1 inioride	< 1	ug/l	
Fluorice by J. FICKE on 09/07/89			EPA # 340.2
rlubride <u> </u>	5 66	mg/l	
Nitrate as a by O on 09/05/89			EPA# 353.2



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FIRAL REFURT

This is a final report.

the results have been checked and authorized for release.



CLIENT

CHRISTIANA METALS CORP

£TT++: (b) (4)

SCM MALL

30-3471-01

Date :

PAGE

09/22/89

3CM # .

00-6471-01

F 0.# :

Order# ·

29800

BCM Number

-27570

LOCATION : WW-7

Client ID . UNFILTERED

Date Samples : 08/29/89

Date Received : 08/29/89

Sampler : BM

`			
lest Description	Results	ปการธ	Test Method
withate as w	5.21	may1	
лигата ав л рв Рими ру д <mark>(b) (4) — сп. 98/29/89</mark>		•	EPA # 150.1
in-field (b) (4)	5 63	Std.Un	G( ) 4 100 1
•		3(0.00	
Specia (b) Lance - Field by	on 98/29/89		EPA #120.1
Specific Conductance (umnos/om #25 Deg C)	250	umnos	



1850 Gravers Road Norristown, PA 19401 -(215) 275-0281

FINAL REPOAT

Tale 15 & final report.

The results have seen checked and authorizes for release

PAGE



CLIENT

CHAISTIANA METALS CORP

ATTN: (b) (4)

BOM MALL

60-6471-01

Date :

98/55/60

BCM # :

00-6471-01

P.O.# :

Order# : 29800

EGM Humger : 927571

Location . MW-1

Client 10 : FILTERED

Date Sampled

**38/29/89** 

Date Received . 08/29/89

Sampler :

Test Cescription	Results	Units	Test Method
Chromium as Cr by (b) (4)			SFA # 6010
วิทาดสวนต	€ 0.01	ma/1	
Cooper by P (b) (4) 4 on 09/13/89		-	EPA # 6010
Comper	<b>り. 03</b> を	mg/1	1
Metal Digastion (No Charge) by LCRI JONES on	1 09/08/89	-	EPA # 3010
Metal Digestion	9/8/89	M/D/Y	. 7
Nickel by P. (b) (4) on 09/15/39			EPA # 6010
%1C).61	< 0.04	mg/1	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FINAL REFORT

This is a rinal report.

The results have been checked and authorized for release



PAGE

CLIENT

CHRISTIANA METALS CORP

ATTN: J(b) (4)

BCM MALL

30-0471-31

Cata :

09/22/89

BCM # :

00-6471-01

P.O.# :

Order# : 29800

BOW Number :

927572

Eccation . Mw-4

ulient is : FILTERED

Date Sampled :

08/29/89

Date Received :

08/29/89

Test description	Results	Units	Test Method"
Chromium as or by P. Bolberein on 09/15/89			EFA # 3010
U AT LIMATUM	J.011	mg/1	
Gupper by P. <mark>(b) (4)</mark> on 09/13/89			EPA # 6010
	0.327	mg/l	
Matal Digestion (No Charge) by ECRI BONES on O	9. 08/99		EPA # 3010
Metal Digestion	<b>9/8</b> /89	M/D/Y	1,5 % 
Nickel by F G(b)(4) on 09/15/89			EPA # 6010
NICKEL	0.269	mg/1	i i i i i i i i i i i i i i i i i i i



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

Suis is a final report

The result: have been checked and authorized for release.



FAGE 18

CLIENT

CHRISTIANA METALS CORP.

ATTN: (b) (4)

acM HALL

30-0471-61

Date

09/22/89

00-6471-01

60M # : ₽.0.# :

Order# : 29800

EGM Humper

327573

Location . MW-5

Client 10 : Filtered

Date Samples :

08/29/89

Date Received :

٦		·		
1	Test Jescription	Results	Units	Test Method
1	Chromium as or by (b) (4)	on 09/18/89		EPA # 6010
d	Caroniam	₹ 0.31	mg/l	
Ļ	Capper by P. <mark>(b) (4)</mark>	3/89	-	EPA # 6010
	Lopper	0.022	mg/l	21 300
	Matai Digastion (No Charge) by	(D)(4) s on 09/08/89		EPA # 3010
	Metal Digestion	9/8/89	M/D/Y	. <u> </u>
1	NIGAGE BY P. (b) (4) 55 09/1	5/89		EPA # 6010
J	HACKEL	0.090	mg/l	
				•



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FIMAL AEFCAT

Jois is a final report.

The results have been checked and authorized for release.



PAGE

CLIENT

CHRISTIANA METALS CORP

дТТИ: JA(b) (4)

BOM MALL

65-6471-01

Order# : 29800

09/22/89

00-6471-01

P 0.# :

Cate

BCM #

BOW Number - 927574

Location . M#-6

Client IL - FILTERED

Date Samples .

08/29/89

Date Received : 08/29/89

sampler : 8M

Test Description	Results	Units Test Method	a
contimitation as dripy ( ) on 09/15/89		EPA # 6010	-
ាក្រសារណា <u>D</u>	0.010	mg/l	
Copper by (b) (4)		EPA # 6010	
UDE 297	0.021	mg/l	
Metal Digestion (No Charge) by (b) (4) on one Metal Digestion	09,08/89	EPA # 3010	
Metal Digestion	9/8/99	M/D/Y	
Nickel by ( 57 09/15/89		EPA # 6010	
ALCHSI D	< 9.04	mg/l	



# BCM Laboratory Division 1850 Gravers Road Norristown PA 19401

(215) 275-0281

FIRAL REPORT

This is a final report.

The results have been anecked and authorized for release.



PAGE

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BOM MALL

00-0471-01

Date :

09/22/89

8CM # :

00-6471-01

P.O # :

Orger# :

29800

BCM Number :

>27575

Location .

MW-7

Client 15

FILTERED

Date Sampled ...

08/29/89

Date Received : 08/29/89

Sampler : BM

Test Description	Results	Units	Test Method
Chromium as Cr by(b)(4)	ç		EPA # 6010
CAFGMIUM	5 220	m <b>g</b> /1	
Copper by P(b) (4) on 097:3789			EPA # 8010
Copper	< 0.02	mg/l	
Metal Digestion (No Charge) by (b) (4)	on 09/08/89		EPA # 3010
Metal Digestion	9/8/59	M/D/Y	
Nickel by P. d(b) (4) on 09/15/89			EPA # 6010
Nickel	0.251	mg/l	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FINAL REPORT

This is a rinal report.

The requits have been checked and authorized for release



PAGE

CLIENT

CHRISTIANA WETALS (b)

Date : BCM # : 09/22/89 00-6471-01

₽.0.#

Crder* :

29800

Buw Number : 927576

ECM MALL

00-6471-61

Location . NW-13

Date Sampled : Date Received :

08/29/89 08/29/89

Client LD :	Sa	ampier	: BM
Test Cascription	Results	Units	Test Method
Purgeable Hallcarbons by $u \in \mathfrak{I}(b)$ (4) on 09/05.89			EFA # 8010
	( 1	ug/1	
-,3-0.Chiorobenzene	< 1	ug/1	,
ithlorosentens	<b>;</b> 1	ug/1	-
aromoform	< 1	ug/1	
Carbon Tetrachioride	₹ 1	ug/1	* ;
Chloropenzena	< 1	ug/1	
Distamachioramethane	₹ 1	ug/1	
3romogichloromethane	< 1	ug/1	
inioncethana	( 1	ug/1	· .
Chilaraform	; 1	ug/l	
:,:-b:cnlorostname	33.6	ug/1	
<pre>&lt;.l-Dicnicrostname</pre>	< ;	ug/1	
(.implicatoristneme	: 54	ug/1	
e, d-qui thitheuropane	4 <b>1</b>	ug/1	
Jid HillS-DickLoropropene	€ 1	ug/1	
Trans-1,3-Dichioropropene	1	ug/1	
Bromomethane (Methy) Bromide)	€ 1	ug/1	
Chioromethane (Wethyl Chioride)	< 1	ug/1	
Mathylane Unionide	<b>( 1</b>	ug/1	
1,1,2,2-Tetrachloroethane	SER PCE	-	
Tetrachicrosinene (PCE)	23.3	ug/1	
Trans-1,2-Dichloroethene	:10	ug/1	
:,:,:=Trichiprocthame	3470	u <b>g</b> /1	
1,1.2-Trich_croethane	; †	ug/I	
Trichiproetheme (TCE)	10605	ug/1	
Trichloroflucromethane	4.1	ug/1	
wing_ Inforice	( 1	ug/1	
gm - Figio by A. SMUCKLER on 08,29/89			EPA # 150.1
ри-F. e.d	7 34	Std.Un	
Specific Concuctance - Field by A. a <mark>(b)(4) : o</mark> n-	08/29/39		EPA #120.1



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

rione ochúmí

Th.3 (3 & hinal report

the teauts have been chacked and Authorized for release.

PAGE



CLIENT

CHRISTIANA METALS COAP

ECM MALL

60-6471-01

Cate ECM #

09/22/89

00-6471-01

P 0.# :

Order# : 29800

gCa kumber :

Cliant LD 🕠

927576

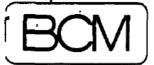
Location : MW-13

Date Sampled ...

98/29/89

Date Received :

lest Leson.ption	Essults	Units   Test Method
specific Co <b>ncuctance</b> (umnos, cm le15 lea C.	360	umhos



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FIRAL REPORT

TALS LE & CITAL TEPOTE.

The results have been checked and authorized for release.



PAGE

18

#### CLIENT

LHRISTIANA METALS CORP.

ATTN: (b) (4)

ECM MALL

30-6471-61

99/22/89

ECM #

00-6471-01

P.O #

Order# : 29800

Bully Humber

Cirent 13

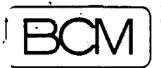
327577

Lucation - - NW-14A

Cate Sampled : 08/29/89

Date Received : 08/29/89

			5.41
Test Description	Results	บทารธ	Test Method
Pargeelia Haictarbons by U 370UDT on 39.03,89			EPA # 8010
2-bioniono <b>cenzene</b>	: 1	ug/1	
f.u-d.chigronamiana	<b>i</b> 1	ug/1	
:,licaloropenzene	< 1	ug/1	
Brometerm	< 1	ug/1	
Carpon Tetrachiorida	< 1	ug/1	
Chloropenzene	4 4	ug/1	
Ulirimodhlorom <b>einame</b>	( 1	ug,1	. • . •
@romodicalorometh <b>ene</b>	€ 1	ug/l	
Unicrostname	€ 1	ug/l	
Ch11, 01077	( 1	<b>u⊈</b> /1	
t,t-lichiofistnähe	€.9	ug/i	
ty2-0:calurdety <b>ans</b>	. 1	ug/1	
.,i-i-chioriethene	15.€	uQ/i	
1.0-D.chucropropane	₹ 1	ug. 1	
G.5-: G-6.Chloropropene	i 1	ug/1	
Trans-1,u-Dichioropropene	\$ 1	ug/l	
promonathana Wathyi Eromida)	s 1	ug/1	
Chibromethana (Mathyl Chibride)	4 1	ug/l	
Hethylene Chioride	<b>4</b> 1	u <b>⊘</b> /≟	
1,3,2,3-Tetrachlordethana	( 1	ug/l	
atraghishdethene .AGE.	₹ 1	ug/1	
Trans-1,2-0.chloroethene	12.5	ug, l	
.,,,:-Tricricrostname	257	ug/i	
i,i,2-Tricilorostn <b>ane</b>	. 1	üÇ, l	
Trichloreethens (TCE)	6 <b>66</b>	ug/1	
Trichlorofluoromethana	< 1	u <b>g</b> /1	
vinvi uniorida	Ç 1	uç/1	
pH - Fisio by A. SMUCKLER on 08/29/89			EPA # 150.1
ph-r.eld	6.95	Sta.un	
Specific Conductance - Field by A(b)(4)	08/29/89		EPA #120.1



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FIRAL MERCAY

This is a rinal report

The results have been checked and authorized for release.

PAGE



CLIENT

CHRISTIANA METALS CORP

ATTN. (b) (4)
GCM MALL

00-0471-01

Cate :

09/22/89

P 0.#

ECM # : 00-6471-01

Orger# : 29800

BCM Number . 927577

LOGATION : WW-14A

Cliant 10 ..

Date Samples : 08/29/89

Cate Received : 08/89/89

Sampler

BM

Results Test Description Units Tast Method _____

specific Conductance (umnos/cm 225 Deg 0)

430

นศิกวร

----



1850 Gravers Road = Norristown, PA 19401 (215) 275-0281

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.



PAGE :

20

CLIENT

CHRISTIANA METALS LORP

лтти: (b) (4)

BUM MALL

JC-6471-C1

Cate

09/22/89

BCM #

00-6471-01

P.O.# :

Order# : 29800

ECA (-unider :

Client IC

)27E78

Location . Mw-148

Date Sampled -

08/29/89

Date Received :

08/29/89

Sampler

SM

			**.
Test Lescription	Fasult3	Units	Test Method
Purgassis Halocarooms by U. STOUCT on 09/05/89			EPA # 3010
1.2-bionicropenzana	<b>(</b> )	ug/1	
1,3-Dichior openzene	s 1	ug/1	t - year-
: +-u.cnicrosemzene	( 1	ug/l	
gramaform	< 1	ug/1	1
Carpon Tetrachloride	<b>ξ</b> 1	ug/1	·
Gn15rccenzane	< 1	ug/l	ىنى <u>دە ئىسىنى</u> بالدائلېمىلىكى
Dipromochioromethane	( 1	ug/l	
Bromodicalcromethane	< 1	ug/1	
Chiorosthana	t 1	ug/1	·
1610737077	< 1	ug/1	
t.:-Cichiordethane	7.3	ug/1	
-,2-0,chioroethane	i 1	ug/1	
i, i-wichloroethene	·3.2	ug/1	
1,1-0.cnloropropane	. 1	ug/1	
ula- ,a-bichloropropene	( )	មជ្ជ/1	
Trans-1,3-Dianioropropene	s 1	ug/l	
aromomethana (Mathyl afomile)	( 1	ug/i	
Chioromethane (Methyl Chiorids)	s 1	ug/l	
Metayishs Chiorida	( 1	ug/1	
1,1,2.2-Tetrachlorcathana	€ 1	ug/l	
etrachicroethens FCE/	€ 1	ug/1	
Trans-1,2-Dichlordethene	10.6	ug/l	
:,:,:-(r:Gniorostnane	323	ug/1	
f, i.2-Trichlorostname	< 1	ug/l	
Trichispothene (TCE)	751	ug/l	
Trichlororluoromsthane	< 1	ug/1	
vinyl Unloride	< 1	ug/1	
ph - Field by A. SMUCKLER on 08:29/89			EPA # 150.1
<u></u>	8.95	Sta. Un	
Specific Conductance - Field by A. (b) (4)	08/29/89		EPA #120.1



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

This is a final report.

This results have been checked and authorized for release.



PAGE .

CLIENT

CHRISTIANA METALS CORP

ATTN. (b) (4)

BCM MALL

10-0471-01

BCM Number : 927578

LOCATION : M#-148

Cl.ant ID

Sate :

09/22/89

3CM # .

00-6471-01

P 3.# :

Order# :

29800

Date Sampled :

08/29/89

Total

Date Received .

08/29/89

Sampler

Test Casor.pt.on Units Test Method 430

specific Conductance (um//os/om/ e25 Deg C)

umhos



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FINAL REPORT

Mis is a final report.

The results have been unecked and authorized for release.



PAGE

CLIENT

CHRISTIANA METALS CURP

ATTN: (b) (4)

BUM MALL

60-6471-01

Sate :

09/22/89

ECM #

00-6471-01

P.O.# :

Order# : 29800

ECA Number : 927579

Location . MW-15

Date Received

Cate Sampled : 08/29/89

08/29/89

Client ID .			Sampler	: <b>SM</b>
Test Dascription		Results	Units	Test Method
Purpeasia Halocarbons by U. STOUDT on 09/05/89	-			EPA # 8010
.,2-D.cn.orodenzene	<	1	ug/l	
t.3-Dianioropanzene	<	1	ug/1	
1.4-Dichiorosenzene	4	1	ug/1	
Bromoform	<	1	ug/1	
Carpon Tetrachioride	<	1	ug/l	
Chlorobenzene	<	1	ug/l	
Dibromochieremethane	<	1	ug/1	
Bromedicaloremethane	<	1	ug/1	
Uniordethame	<	1	ug/1	
1010roform	;	1	ug/l	
1.1-01561orostname		53.8	ug/1	
1.2-Dichlordeth <b>ane</b>	•	1	ug/1	
1,1-0:0.lorosin <b>ens</b>		564	ug/1	
1.2-Cichioropropane	<	1	ug/1	
Cas,3-Bachworopropene	;	1	ug/i	
Trans-1,3-D:chlcropropene	4	1	ug/1	
Bromomethana (Methyl Bromice)	<	1	ug/1	
Caloramethane Gmethyl Chlorida)	Ś	1	ug/1	
Methylshe Chloride		1.8	ug/1	
1,1,2,2-Tetrachloroethane		SEE PCE		
Tetrachioraethene (PCE)		39 3	ug/1	
Trans-1,2-Dichloroathene		570	ug/1	
:,t,:-Trichlordetmane		7800	ug/1	
1,1,2-Trickloroethane	<	1	ug/1	
frighlarcethene (TCE)		44400	ug/1	
Trichlorofluoromethane	<	1	ug/1	
vinyl Unioriae	<	1	ug/l	
pH - F1813 by A. SMUCKLER on 08/29/89				EFA # 150.1
ph-Field		7.13	Sta.∪n	
Specific Conductance - Field by A (b) (4) on 08	8/29/	<b>/</b> 89		EPA #120.1



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

CARRIE MERCAT

This is a ridal report.

The Pasults have team checked and authorized for release.



PAGE

CLIENT

LARISTIANA METALS CORP

ATTN: (b) (4) OHNOR

BCM MALL

30-0471-01

Cate : 09/22/89

P.Q.# :

2CM # : 00-6471-01

Date Samples

Orger# : 29800

BCM Number .

927579

Location : W-15 Cliant ID

Date Received : 08/29/89

08/29/89

Sampler

BM

Test Leschistion Results Units Test Method umnos specific conductance (bmncs/cm 925 Deg 6) 3:0

-82-



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FINAL REPORT

This is a rinal report.

the results have been checked and authorized for release.



PAGE

CLIENT

SHRISTIANA METALS CORP

ATTN: (b) (4)

SCM MALL

30-6471-51

Order# :

09/22/89 00-5471-01

BCM # : P.G.# :

Date

29800

BOM Number :

Location .

Client ID

#27560

MW-16

Date Sampled :

08/29/89

Date Received :

08/29/89

Sampler

BM

Test Description	Results	Units	Test Method
Purgeable Halocarbons by U. STOUDT on 09/06/80	,		EFA # 8010
::2*L:chiorocenzens	<b>₹ 1</b>	ug/l	
1,3-Dichierosenzane	4.1	ug/l	
(, +-0:chioropenzene	< 1	ug/1	
Aromororm	< 1	ug/l	
Carbon Tetrachloride	< 1	ug/l	
Chloropanzane	< :	ug/l	104 T T
2:5f0m0ch10f0metname	<b>( 1</b>	ug/1	
aremosicaleromethana	<b>( 1</b>	ug/1	
uniordethane	18.6	ug/l	
Çalorofor <b>m</b>	€ 1	ug/l	
1,1-bichiordathane	419	ug/l	* #m
1,2-Dichlordathane	41.8	ug/l	
:,1-bicaloroethene	140	ug/l	
1.2-Dichidropropane	₹ .1	ug. 1	
115-1,3-Dichloropropens	< 1	ug/1	
Trans-1,6-Elignloropropene	< 1	ug/l	
iromomethame (Methyl Bromide)	< 1	ug/l	
Coloroxethane (Nethyl Chioride)	ζ 1	ug/l	
Wetnylane Chloride	< 1	ug/1	
1.1,2,2-Tetrachloroethane	SEE PCE		Faring.
Jethachlorcethene (FCE)	7.4	ug/l	1 7,41
Trans-1,2-Dichloroethens	169	ug/1	
f, i.s-in; onluruethane	2340	ug/l	
1,1,2-Trichloroetmane	<b>i</b> 1	ug/l	+ #1 y
Crichiorosinene (TCE)	4580	ug/l	
Trichlorofluoromethane	₹ 1	ug/1	
Vinyl Unioride	ξ 1	<b>ug/l</b>	
pm - Field by A. SMUCKLER on 08/29/89		ı	EPA # 150.1
pH+Fishd	7.18	St <b>d</b> , Un	
Specific Conductance - Field by A. (b) (4)	05.29/89		EPA #120.1



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

This is a final report.

Die Pesults have deen checked and authorized for release

FAJE

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

SCM MALL

30-9471-91

Date

09/22/89

SCM #

P 0.#

00-6471-01

Graer# :

29800

BCM Number .

927580

Location : MW-16

C1:000 13 .

Date Sampled

14.5 08/29/89

Date Received :

08/29/89

ाह्य के हर

1000

118

- .0

Sampler

BM

Test Saschiotion	Results	Units	Test Method
·			
ಕ್ರಕರ್ಮ,: Conductande(Lmnos.cm 025 ಟಕ್ಕಂನ)	390	UMr 05	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FINAL REPORT

Mala la Elital resort.

The results have been checked and authorized for release.



CLIENT

CHRISTIANA METALS CORP

αττα · (b) (4)

BOW MALL

30-6471-31

Date : 09/82/89

3CM # :

00-6471-01

F.O #

Order# : 29800

Bun number : Je7581

Cliant ID :

Location . TRIP BLANK

Date Received : 08/29/89

08/29/89 cata Samples - 08/29/89

Sampler

Test Description	Rasults	U#113	Test Method
***************************************			
Pargessia helocarbons by U(  on 0 0 0 0 0 89			EPA # 8010
tie-Eigniorpeenzens	. 1	ug/1	
t u-Buchuchasene	< 1	ua/1	

Grigesola melocarbons by U <mark>. Extent</mark> on 0 00	8.89	
tra-bionior scenzens	. 1	<b>u</b> ⊈/1
: u-Dichierobenzene	< 1	ug/l
, inioropenzene	; 1	ug/1
Bromotorm	₹ 1	ug/l
Carbon Tetrachloride	· · · · · · · · · · · · · · · · · · ·	ug/1
Caloropenzene	₹ 1	ug/1
libramochioromathana	< 1	ug, i
Brombaichlerömeth <b>ane</b>	< 4	ug/1
uniordeaname	< 1	<b>ug/</b> 1
Chiloraform	< 1	ug/1
:,:-U:Snicroschane	₹ 1	ug/1
to: Bichichene	· 1	ug/1
:,!-Gicalorostnena	₹ 1	ug/1
F, c-U. Chicropropane	₹ 1	u⊈, l
ULS-1,2-Dichloropropens	₹ 1	<b>4⊈/</b> 1
Trans-1,3-0.caloropropane	ζ 1	ag/1
Sromomethane (Methyl Bromide)	£ 1	ug/1
Chioromethana (Methyl Chiorice)	< 1	ug, 1
deinylene Chioride	< 1	<b>⊌</b> ⊈/1
1,1,2,2-Tetrachloroethane	Κ 1	ug/1
latrichispoethene (FCE)	K 1	ug/1
Trans-1,2-uichlordethene	< 1	ug/1
i,i,i-Tr.onitroetrane	< 1	ug/l
1.1,2-Trichloroethane	<b>&lt; 1</b>	ug/1
Tr.anioraethene (TCE)	< 1	ug/1
Trichlorofluoromethane	< 1	ug/1
vinyl Caloride	₹ 1	ug/1

ug/1



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FINAL REPORT

This is a final Teport.

The results have been checked and authorized for release.



PAGE

CLIENT

CHRISTIANA METALS CORP.

ATTN (b) (4)

BOM MALL

50-6471-01

Date :

09/22/89

BCM # : P.G.# :

00-6471-01

Oraer# : 29800

BCM wumber :

127582

Location . FIELD BLANK

Client ID

Date Sampled .

08/29/89

Date Received : 08/29/89

Sampler

Test Description	Results	Units	Tast Method
u. (4) .: on perci			EPA # 8010
t, ā-Dichlorobenzene	<b>&lt; 1</b>	ug/l	
1,4-0:Chlorodenzana	< t	ug/l	
1.4-U:onloropenzane	( 1	ug/i	
Bromorcem	<b>&lt;</b> 1	ug/l	, it is
Carpon Tetraculoride	< 1	ug/l	
Chloropanzene	< 1	ug/l	
Dipremeenleremethane	f 1	ug/1	
Bromed:chloromethane -	< <b>\$</b>	ug/1	
Uniordethane	€ 1	ug/i	
Calcratorm	₹ 1	ug/1	
t,t-Dichlordethane	C 1	មជ្ជ/1	
1,2-5.chiorbethane	< 1	ug/l	
1,1-Dichlordethene	< 1	ug/1	
1.2-Dichioropropane	< t	u <b>ğ</b> . 1	
Dis-1,3-Dichloropropene	( 1	ug/1	
Trans-t,3-3:anicropropene	<b>( 1</b>	ug/1	
Bromomathame Unethyl Bromide:	€ 1	ug/1	
Coloromethane (Methyl Chlorida)	<b>:</b> 1	ug/1	
methylene unlotics	( 1	ug/l	
1,1,2,2-Tetrachloroethane	<b>&lt; 1</b>	ug/1	
Tetrachioristheme (PCE)	¢ †	ug/i	
Trans-1,2-Dichloroethene	< 1	uÇ/l	
),1.1-TrichlorDethame	< 1	ug./1	
1,1,2-Trichloroethane	<b>:</b> 1	ug/1	
Trichloroethene (TCE)	< 1	ug/1	
Trich_crofluoromathana	< :	ug/l	
vinyl Chloride	( ;	ug/1	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FERAL REPURT

This is a final "aport

The results have been checked and authorized for release.



PAGE

CLIENT

CHRISTIANA METHLS CORP.

ά₹ΤΝ: (b) (4)

BOM MALL

60-6471-61

ECM Number : 927582

Location - FIELD SLANK

Client Lb :

Date Received : 08/29/89 ...

 $A_{T_{\mathcal{L}(G)}}$ Date Sampled : 08/29/89 .

1

Sampler

8M

Date . 09/22/89

Order# : 29800

BCM # : 00-6471-01

Test Cescription

Results

Units Test Method

P O.# :

SCM Laboratury Director

Lab Lertifications.

LETTIFIED DY

FA - 46-007 AL - 40300

aJ - 77175 alO - 135

EPA BULK ASEESTOS CC - 3339



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PAGE

FIGHL RESURT

THIS is a final report.

The Tesults have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

00-6471-01

Date

09/21/89

ecm *

00-6471-01

P O.# :

Orger# :

29827

BCM Number LCCEtion

927714 WW-8

Date Sampled :

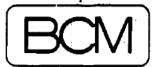
08/30/89

Date Received .

08/30/89

Sample:

CLISIC IS SWIETERED	2 dill	pre	АП	
Tast Description	Résults	Jnite	Test Method	
Full 380016 -61000rbons by 0 (b) (4) on 09/06/89			EPA # 8010	
(,1-1,3 disropanzena	< 1	ug/1		
3-bichlordbanzene	( 1	ug/1		
1,4-Diamioropanzane	( 1	ug. 1		
Bromeform	€ 1	ug/l		
Carsia Tetrachloride	< 1	ug/1		
unlorssengens	< 1	ug/1		
Dibromocylofomethane	₹ 1	ug/1		
aramodianiar <b>amethane</b>	< 1	ug/1	•	
Chilor Seth <b>ana</b>	16.ĕ	ug/1		
UNIDEC OFF	< 1	ug/1	٠,	
i,:-Dichicroetrane	3.2	ug/1		
lianciculorostname	<b>← 1</b>	ug/1		
s 1-1.0 Abroethene	37.7	ug/1		
Tub-elchiorouropane	< 1	ug/1		
1:3,3-5:chltropropene	<b>C. 1</b>	ug/1		
Trans-1,3-0:chloropropere	: <b>t</b>	ug/1		
aromimethane (Methyl Bromids)	< 1	ug/1		
infortmethene (Methyl Chicride)	< 1	ug/1		
Methylane Chlorice	1.6	ug/1	n fizz	
i.,,e,e-fatrachioroathana	SEE PCE			
Tatraduloroetr <b>ene (PCE)</b>	9.3	ug/1	····•.	
Trans,2-Ciuniordethene	803	ug/l		
.,:,:-Trioniorcethane	399	ug. i	\$. % 	
1,1.2-Tricrioroethane	7 <b>1</b>	u <b>g</b> /1	1.	
Trichiordethene (TCE)	2860	ug/l		
Tricklorotluoromethane	< 1	ug/l		
vinyl Chioride	8 <del>6</del> . S	ug/l		
Fluoride by U. FICKE on 00/07/89			EPA # 340.2	
F.WGT.GE	1.11	#i <b>g</b> / 1		
wateratic as a by U. <mark>B</mark> ill to the on 1976\$189		-	EPA# 353.2	



# BCM Laboratory Division 1850 Gravers Road Norristown, PA 19401

(215) 275-0281



FINAL REPORT

FAGE

2

ints .s a rinal report

The results have been checked and authorized for release.

CLIENT

UHRISTIANA METALS CORP

ATTN: (b) (4)

BUM MALL

60-6471-01

JAFAL IEFEU

Date : 09/21/89

BCM # P O #

00-6471-01

Orger#

29827

BCA Number :

Clish in

.27714

4w-8 Location

Date Sampled .

08/30/89

Date Received : 08/30/89

sampler

Test Description	Results	Units	Test Method
Nitrate 88 N	0 327	mg/1	
pa - +16±0 by <del>day 558100</del> 0π UB/30/89			EPA # 150.1
βH-F16. <b>d</b>	6.91	Std.Un	
specific Conductance - Field by N(b) (4) on 08/30/89			EPA #120.1
Spacific Conductance(umnos/cm #25 Dec C)	440	umnos	



# BCM Laboratory Division 1850 Gravers Road Norristown, PA 19401

(215) 275-0281



FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTH: (b) (4)

BCM MALL

00-6471-01

PAGE

Date : 09/21/89

BCM # : 00-6471-01

P.O.# :

Order# : 29827

BOM Number .

Location

927715

MW-BA

Date Sampled : 08/30/89

Date Received : 08/30/89

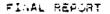
Semuler

	Sempler	
Results	Units	Test Method
		EPA # 8010
4 1	ug/1	
3 1	ug/1	
< 1	ug/1	
< 1	ug/l	
< 1	ug/l	
< 1	ug/1	
₹ 1	ug/1	
< 1	ug/1	
₹ 1	ug/1	
€ 1	ug/:	
2.8	ug/1	
: 1	ug/1	
1 1	ug/1	
<b>₹</b> . T	ug/l	
< 1	u <b>g</b> /1	
< 1	ug/l	
< 1	ug/1	
× 1	ug/1	
1 1	ug/1	
SEE POR		
9.2	ug/1	•
798	ug/1	
395	ug/1	
₹ 1	ug/l	
2750	ug/1	
< 1	ug/1	
60.8	ug/1	
		EPA # 340.2
1.02	mg/l	
		EPA# 353.2
	C 1	Results Units



1850 Gravers Road Norristown, PA 19401 (215) 275-0281





Tois is a rinal report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BOW MALL

66-6471-01

UNFILTERED

Craer# :

09/21/89

00-6471-01

P.O #

BCM # :

Cate

29827

BCW Number :

327715

Date Sampled :

08/30/89

Location

Date Received :

: h:w-6A

08/30/89

Sembler

Test Lescription	Results	Units Test Method
Nitrate as N	0.121	mg/1
pH - Field by M. FISH on 08/30/69 pH-Field	6.91	EPA <b>4 (50.</b> 1 Std.Un ାନ୍ୟର୍ଥିଲ
Specific Conductance - Field by (b)(4) on 08/30/ Specific Conductance (umnos/cm @25 Deg C)	89 440	EPA #120.1



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FIMAL AEAGAT

This is a final report.

The results have been checked and authorized for release.

PAGE

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

30-5471-01

Date SCM #

09/21/89

30-6471-01

7.0.#

Order# : 29827

BCM number . Location

927716

: :nw-9

Date Sampled :

08/30/89

Date Received :

08/30/89

OT. SIL 10 . VIN 16 (ENED	3.8	mple:	AN ARTHUR
7351 Description	Results	Units	Test Method
Furgeable Halocarbons by (b) (4) on 09/06/89			EPA # 8010
1,2-0:chloropanzene	< 1	ug, 1	
:,3-bichiorocenzene	₹ 1	ug/1	
1,4-D.chloropanzene	< 1	ug/1	
aromoform	< 1	ug/1	
Carpon Tetrachloride	< 1	ug/l	
Chloropenzene	< 1	ug/l	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Dipromocnloromethane	< 1	ug/l	7 . Ag
eramicalaniora <b>methane</b>	€ 1	<b>u</b> ₫/1	
Chloroethane	< 1 · · · · · · · · · · · · · · · · · ·	ug/1	t Author
inioroform	1 C 1	u <b>g</b> /1	
i, i-cicniorseinane	20.6	ug 1	
: 2-010.1070etname	< ↑	ug/l	
1,1-1.cmiordethane	<b>33.3</b>	1g/1	
:.2-U.chioroprop <b>ane</b>	< †	ug/1	
Gis-1,3-Dicaloropropene	< 1	ug/1	
Trans-1,3-610mioropropene	< 1	ug/1	
Bromomethane (Methyl Bromide)	<b>&lt; 1</b>	ug/1	\$ 2 x
Interemethane (Methyl Chierida)	< 1	ug/1	
Methylene Chloride	2.4	ug/l	1 1 miles
:,:,c.z-Tetrachloroethane	BEE PCE		
Tetrataloroethene (PGE)	14.9	u <b>g</b> /1	
Trans-1,1-Bickloroethane	462	ug/1	
1,1,1-Trichlorsethane	621	ug/l	
1.1.2-Trionioroethane	< 1	ug/1	
Trichloroeinene (TCE)	4130	ug/1	-
Trionisrofluoromethane	< 1	ug/1	
vinyl Dhlo <u>ride</u>	14.4	ug/l	
Fluorida by ( on 09/07/89		-	EPA # 340.2
Fluorica D	2.57	mg.1	
Gainsta as 5 by (b) (4) on 09/05/59		-	EPA# 353.2



1850 Gravers Road Norristown, PA 19401 (215) 275-0281



FINAL REPORT

Tois is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN:(b) (4)

BOM MALL

30-6471-01

Order# : 29827

Date : 09/21/89

BCM # : 00-6471-01

P.O.#

Bud Humber : 927716

Location . Mw-9

Date Sampled

08/30/89

Date Received . Schiple!

08/30/89

CITE IL IU JOE IL TEREU

Test Cascription .......

Mitrate as N_

pH - Field by (b) (4) on 08/35/89 0.:06

mg/l

Units Test Method

ZH-F1310

Specific Conductance - Field by (6) (4)

cn 08/30/89 Specific Conductance (umnos/cm #25 Deg C)

6.98 450

Results

Sta.Un

EPA #120.1

EPA # 150.1

umnos



1850 Gravers Road : Norristown, PA 19401 (215) 275-0281



FINAL AEPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT '

CHRISTIANA METALS CORP.

ATTN: (b) (4)

ECM MALL

JU-0471-01

09/21/89

00-6471-01

2CM # . P.O.# :

PAGE

Order# : 29827

Date :

BCM Number -Location

127717

MW - 8

Date Sampled .

08/30/89

Date Received :

08/30/89

Cilent 15 TILTERED Sampler

Test Description Sesuita Units Test Method Chromium as or by 🛚 ST 69/15/89 EPA # 5010 Caromium 0.012 mg/l Capper by on 09/19/89 EPA # 6010 Capper ( 0.02 mg/l Metal Digestion (No Charge) by on 09/14/89 EPA # 3010 Metal Digastion 9/14/39 M/D/Y Nickel by(b)(4) cn 63/15 89 EPA # 6010 NICKEL < 0.04 mg/l



1850 Gravers Road Norristown, PA 19401 (215) 275-0281



FIRAL REPORT

This is a final report.

The results have peen checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4): [ SCM MALL

00-6471-01

BCM Number : 927718

Location : MW-8A

-----

CITERL ID : FILTERED

Date Sampled :

Date Received :

Sample:

mg/1

mg/1

M/D/Y

FAGE :

Date :

SCM # :

P.O.# :

Orger# :

08/30/89

09/21/89

08/30/89

EPA # 6010___

EPA # 6010

EPA # 3010

00-6471-01

Test Description Results Units Test Method

on 09/15/89 Caromium as Cr by(D)(4)

Caronitum

Copper by (D) (4) on 09/19/89

Copper

Metal Digestion (No Charge) by (b) (4) NES on 09/14/89

Metal Digestion Nickel by (b) on 09/15/9**9** 

NICKEL

6 0 01

< 0.02

< 0.04

9/14/89

mg/1

EPA # 6010

يعط عا



1850 Gravers Road Norristown, PA 19401 (215) 275-0281



FIRAL REFURT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

SCM MALL

00-6471-01

Date

FAGE

09/21/89

3CM # ;

00-6471-01

P.O.#

Order# :

29827

BCM Number . Location

927719

TILTERED

: (AW-9

Date Sampled : Date Received :

08/30/89

08/30/89

Sample:

Results Units Test Method

on 09/15/39 1 0.01

mg/l

EPA # 6010 EPA # 6010

Capper av on 09/19/89

Copper

Metal Digestion (No Charge) by (b)(4)

on 09/14/89 9/14/89 mg/1

M/D/Y

EPA # 3010

Metal Digastion

Chromium as or by(b)(4)

Test Discription

Coromium

Nickel by (b) (4) on 30/15/89

Nickel

< 0.04

< 0.02

mg/l

EPA # 6010



1850 Gravers Road Norristown, PA 19401 (215) 275-0281



FIGAL REPORT

This is a final report.

The results have usen checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN. (b) (4)

SCM MALL

U0-0471-01

Order# :

Date : 09/21/89

ECM # : 00-6471-01

P.Q.# :

PAGE

29827

BCM Number Location

Client L

927720

:-W-2

Date Sampled :

08/30/89

Date Received :

08/30/89

Test Discription		Results	units	Test Method
Furgeable mailtearpoins by (b) (4) on 09/12/89				
1.2-Dichioropenzene	<	40	1107/3	EPA # 8010
1.3-610Aloropenzene	-	10	ug/1	
1,4-D.chloropenzene	ì		ug/1	
Bromoform	•		ug/1	
Carbon Tetrachloride		10	ug/1	
·	<b>(</b>		ug/1	
Chloropenzane	•	10	ug/1	
Dipromocaloromethane	<b>(</b>		u <b>g/1</b>	
eromssichloromethane	-	10	ug/l	
Chloroethane	<b>(</b>		ug/l	
Caloroform		10	ug/1	
f. I-Dichloroethane		157	ug/l	
. 2+Dichlorosthane		1050	ug/l	
(,)-Dichliroethens		611	ug/1	
1.2-biolipropropane	•	10	ug/1	
Cis-1,3-Dichloropropene	<		ug/1	
Trans-1,3-Dichloropropene	<		ug/l	
ëromomethane (Methyl Bromide)	<		ug/l	
Calorometrane (Methyl Chloride)	•	10	ug/l	
Methylene Caloride		10.9	ug/l	
i,:,ê,ê-fetr <b>ac</b> niorost <b>nane</b>		SEE PCE		
Tetracklordethame (PCE)		85.6	ug/l	
Trans-1,2-Dicalorcethene		685	ug/l	
1,1,1-Trichloroethane		17300	ug/l	
1.1.E-Trichloroethane	<	10	ug/1	
Trichloroethene (TCE)	;	36100	ug/l	
Trichlorofluoromethane	<	10	ug/l	
Vinyl Calbrice	<	10	ug/l	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281



11

FIRAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

SCM MALL

30-6471-01

Order# :

ł

Date

PAGE

09/21/89

00-6471-01

9CM # P.Q.#

29827

BCM Number : Location

927721

MW-3

Date Sampled :

08/30/89

Date Received :

08/30/89

<del>Circut ID</del>

Sampler

Test Description Units Test Method Results ---------- --------Furgeable Halccarbons by on 09/12/89 EPA # 8010 1,2-Dichlorapanzene < 10 ug/1 :.3-Dichlorobanzane ( 10 ug/l 1,4-Dichloropenzene < 10 ug/1 Bromoform < 10 ug/l Carpon Tetrachloride < 10 ug/1 Chloropenzene < 10 ug/l Dibromochioromethane ( 10 ug/1 Bromogichloromethane ₹ 10 ug/1 Chlorostnans < 10 ug/1 Calcroform < 10 ug/1 1.1-Dichloroethane 14.0 ug/1 1.2-Dichlorosthane < 10 ug/l 1,1-Dichlorcethene 103 ug/1 1,2-Dichloropropane < 10 ug/l Cis-1,3-Dianleropropene < 10 ug/1 Trans-1,3-Dichloropropens < 10 uq/1Bromomathane (Methyl Bromide) < 10 ug/l Chloromethane (Methyl Chloride) < 10 uq/1 Methylene Chloride < 10 ug/1 1,1,2,2-Tetrachlorosthans SEE PCE Tetrachicrostheme (PCE) 124 ug/l Trans-1,2-Dichlorosthens 236 uq/1 1,1,1-Trichlorosthans 3130 ug/l 1,1,2-Trichlorgethane < 10 ug/1 Trichloroethene (TCE) 199000 ug/1 Trichlorofluoromethane < 10 ug/1 Vinyl Chloride < 10 ug/l



1850 Gravers Road -Norristown, PA 19401 (215) 275-0281



FINAL REFORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Order# :

PAGE

Date

BCM #

09/21/89

00-6471-01

_

P.O.# :

29827

BCM Number . Location :

CITENT 10

. 927722 : MW-10 Date Sampled :

08/30/89

Date Received

08/30/89

Sampler

AH

Test Description	Results	Units	Test Method
Purgeable Halocarpons by (b) (4) on 09/08/89			EPA # 9010
1,2-Dichicropenzene	<b>( 1</b>	ug/1	
1.3-Dichioropenzens	< 1	ug/1	100
1,4-Dichloropenzena	<b>(1</b>	ug/1	## ## ## ## ## ## ## ## ## ## ## ## ##
Bromoform	<b>&lt; 1</b>	ug/1	
Carbon Tetrachloride	<b>&lt; 1</b>	ug/l	
Chlorodenzene	<b>&lt; 1</b>	ug/1	
Dipremochloromethane	< 1	ug/l	र क्रिकेट स्किन्
Bromodichloromethane	< 1	ug/l	•
Colorcatnane	< 1	ug/1	V=
Chioroform	<b>(1</b>	ug/1	
t,1-Dichloroethana	1.4	ug/1	
1.2-Dichloroethane	< 1	ug/1	
1.:+Dichibrostnens	< 1	ug/1	
:,2-Dichloropropane	< t	ug/1	
Cis-1,3-Dichloropropene	< 1	ug/l	
Trans-1,3-Dichloropropene	< 1	ug/1	
Bromomethane (Mathyl Bromide)	< 1	ug/l	- · · · · · · · · · · · · · · · · · · ·
Chloromethane (Methyl Chloride)	< 1	ug/1	• •
Methylene Chloride	< 1	u <b>g/1</b>	17 J. 14 4.
1,1,2,2-Tetrachlorostname	<b>&lt; 1</b>	ug/1	
Tetrachloroethane (PCE)	< 1	ug/l	/·
Trans-1.2-Dichlorcethene	4.6	ug/1	
1,1,1-Trichloroethane	84.2	ug/1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1,1,2-Trichloroetmane	< 1	ug/l	
Trichloroethene (TCE)	93.8	ug/l	
Trichlorofluoromethane	€ 1	ug/l	
Vinyl Chloride	<b>( 1</b>	ug/l	



# BCM Laboratory Division 1850 Gravers Road Norristown, PA 19401

(215) 275-0281

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Date

PAGE

09/21/89

00-6471-01

BCM # P.O.# :

13

Order# :

29827

BCM Number : Location

927723

: MW-11

Date Sampled :

08/30/89

Data Received :

08/30/89

Sampler

	•	•	
Test Description	· Results	Units	Test Method
Purgeable Halocarbons by (b) (4) on 09/11/89			EPA # 9010
1,2-Dichloropenzene	< 10	ug/1	
1,3-Dichloropenzene	<b>( 10</b>	ug/l	7
1,4-Dichloropenzene	< 10	ug/1	
Bromoform	< 10	ug/1	
Carpon Tetrachloride	< 10	ug/l	
Chloropenzene	₹ 10	ug/l	<del>12-4</del>
Dipromochloromethane	< 10	ug/l	
Bromodianloromethane	< 10	ug/1	
Chloroethane	< 10	ug/1	•
Chioroform	₹ 10	ug/1	
1,1-Dichloroethane	900	ug/1	
:,2-Bicnlorcethane	103	ug/l	
t, t-Cicnlordethene	300	ug/1	
:,2-D:cnloropropane	< 10	ug/1	
Cis-1,3-Dichloropropene	< 10	ug/1	
Trans-1,3-Dichloropropens	< 10	ug/l	
Bromomethane (Methyl Bromide)	< 10	ug/l	F. 1
Chloromethane (Methyl Chloride)	< 10	ug/l	
Methylene Chloride	15.0	ug/l	11/2
1,1,2.2-Fetrachlorgethane	SEE PCE		
Tetrachloroethene (PCE)	32.1	ug/l	
Trans-1,2-Dichloroethene	1970	ug/l	
1,.,:-Trichloroethane	20700	ug/l	w .vi .
t,1,2-Trichloroethane	< 10	ug/1	
Trichloroethene (TCE)	17100	ug/l	
Trichlorofluoromethane	< 10	ug/l	
Vinyl Chloride	< 10	ug/1	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281



CINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN. (b) (4)

SCM MALL

00-6471-01

Date : 09/21/89

PAGE

BCM # :

00-6471-01

P.O.# :

Order# : 29827

BCM Numper .

927724

Location : MW-12

Date Sampled : 08/30/89

Data Received : 08/30/89

Sampler

Test Description	Results	Units	Test Method
Eurgeaple Halocarbons by (b)(4) on 09/08	/89		EPA # 8010
1,2-D:cnloropenzene	< 10	ug/l	
1,3-Dichloropenzene	< 10	ug/1	
1,4-Dichloropenzene	< 10	ug/l	
Bromoform	< 10	ug/1	
Carbon Tetrachloride	< 10	ug/l	
inloropenzene	< 10	ug/1	
Dipromochloromethane	< 10	ug/l	
Bromodichloromethana	< 10	ug/l	
Colordeinane	< 10	ug/1	
Chiproform	< 10	ug/l	
1,1-Dichloroethane	12.8	ug/l	
t.2-Dichloroethane	₹ 10	ug/1	
1,1-Dichloroethene	< 10	ug/l	
1.2-Bichloropropane	< 10	ug/l	
J.S-1,3-Dichloropropene	< 10	ug/l	
Frans-1,3-Dichloropropene	< 10	ug/l	
aromomethane (Methyl Bromide)	< 10	ug/l	
Chloromethane (Mathyl Chloride)	< 10	ug/l	•
Methylene Chloride	14.8	ug/l	
1,:,2,2-Tetrachloroethane	SEE PCE		
Tetrachicrosinens (PCE)	14.7	ug/l	
Frans-1,2-Dichlorosthens	85.9	ug/1	
i,i,1-Tricalorcethane	540	ug/l	
1,1,2-Trichlorcethane	< 10	ug/l	
Trichloroethene (TCE)	3940	ug/l	
Trichlorofluoromethane	₹ 10	ug/1	
vinyl Calcride	< 10	ug/l	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281



FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Date : 09/21/89

BCM # 00-6471-01

P.O.# :

PAGE

Order# : 29827

BCM Number :

927725

LOCALION : TRIP BLANK Date Sampled :

08/30/89

Date Received : 08/30/89

Sampler cirent ib

Test Description	Results	Units	Test Method
Purgeable Halocarbons by (b)(4) on 09/08/	89		EPA # 8010
1,2-DichlofoDanzene	<b>( 1</b>	ug/1	
1,3-Dichloropenzene	( 1	ug/l	
1,4-Dichloropenzene	< 1	ug/l	
Bromoform	< 1	ug/l	11 mm 110
Carbon Tetrachloride	< 1	ug/l	
Chloropanzene	< 1	ug/l	
Dipromochicromethane	< 1	ug/1	
Bromosichloromethane	< 1	<b>ug</b> /1	
Chloroethans	<b>( 1</b>	ug/l	
Chloroform	< 1	ug/1	
1,1-Dichicroethane	< 1	ug/1	
1.2-Dichlorcethane	< 1	ug/l	
1,1-Dichloroethene	<b>( 1</b>	ug/l	
1,2-Dichloropropane	< 1	ug/1	
Cis-1,3-Dichloropropene	< 1	ug/l	
Trans-1,3-Dichloropropene	< 1	ug/1	
Bromomethage (Methyl Bromide)	< 1	ug/l	
Inloromethane (Methyl Chloride)	< 1	ug/1	
Methylene Chloride	<b>(1</b>	ug/l	
:,1,2,2-Tetrachloroathane	€ 1	ug/l	
Tetrachloroethene (PCE)	< 1	ug/l	
Trans-1,2-Eichloroethene	< 1	ug/1	
1,1,1-Trichloroethane	<b>&lt; 1</b>	ug/l	
1,1,2-Trichloroethane	< 1	ug/l	
Trichlorosthene (TCE)	< 1	ug/l	
Trichlorofluoromethane	< 1	ug/1	
Vinyl Chloride	< 1	ug/l	



## BCM Laboratory Division 1850 Gravers Road Norristown, PA 19401

(215) 275-0281



16

FINAL REPORT

BCM Number :

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Location

927726

FIELD BLANK

PAGE

Date 09/21/89

SCM #

00-6471-01

P.O.#

Order# :

29827

Date Samples

Date Received :

08/30/89 08/30/89

Client 10		ampler	: AH
Test Description	, Results	Units	Test Method
Purgeable Halocarbons by (b) (4) on 09/08/89			EPA # 8010
1,2-Dichlorobenzene	< t	ug/1	
1,3-Dichlorobenzane	< 1	ug/1	
1,4-Dichlorocanzene	< 1	ug/l	
Bromoform	<b>₹ 1</b>	ug/1	-71224
Carpon Tetrachloride	<b>(</b> 1	ug/l	2
Cnloropanzens	₹ 1	ug/1	-21
Dipromochioromethane	<b>&lt; 1</b>	ug/1	<b>.</b>
Bromogichloromethane	₹ 1	ug/l	
Cnloroetnane	< 1	ug/l	ان ان ان ان ان ان ان ان ان ان ان ان ان ا
Cnioroform	<b>C</b> 1	ug/1	
1,1-Dichlorostname	< 1	ug/l	
1.2-Dichlorosthans	< 1	ug/l	
1,1-Dichicrostnene	< 1	ug/1	
1,2-Dichloropropane	<b>C</b> 1	ug/l	
Cis-1,3-Dichloropropene	<b>( 1</b>	ug/1	
Trans-1,3-Dichloropropene	<b>4.1</b>	ug/l	
Bromomethane (Methyl Bromide)	<b>( 1</b>	ug/1	a Marie
Chioromethane (Methyl Chloride)	∢ 1	ug/1	( )
Methylene Chloride	< 1	ug/1	100
1,:,2,2-Tetrachloroethane	< 1	ug/1	
Tetracaloroethene (PCE)	< 1	ug/l	المراجعة المراجعة المراجعة المراجعة المراجعة المراجعة المراجعة المراجعة المراجعة المراجعة المراجعة المراجعة ال المراجعة المراجعة ال
Trans-1,2-Dichiprosthems	< 1	ug/1	2 vil
1,1,1-Trichloroethane	< 1	ug/l	es
1,1,2-Trichloroethane	< 1	ug/1	' '
Trichloroethene (TCE)	<b>&lt; 1</b>	ug/l	
Trichlorofluoromethane	<b>(</b> 1	ug/l	
Vinyl Chloride	< 1	ug/l	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

FINAL REPORT

PAGE :

17

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

8CM MALL

00-6471-61

Date : 09/21/89

BCM # : 00-6471-01

P.O.# :

Order# :

29827

BCM NUMBER : 927726

Location : FIELD BLANK

Date Sampled :

Sampler

08/30/89

÷ :

.

Date Received :

08/30/89

Circut 15

Test Description _____

Results

Units Tast Method

Cartified by :

BCM Laboratory Director

Lap Certifications:

PA - 46-007 AL - 40300

NJ - 77175

MD - 136

EPA BULK ASBESTOS OC - 3339



1850 Gravers Road . Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS BCM Eastern Inc. 1 PLYMOUTH MEETING 215-825-3800

SAGE

INAL SEPIRT

Brs 15 B midal mesert

ne results have been dressed and Autromized for religate.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

JU-6471-01

SCW #

Date Sampled

10/20/89

00-6471-01

# O #

Jate

Orgere 30302

SCM NUMBER Location

Grient 12

030339

09/28/89

Date Received .

09/28/89

Sampler

ĖΜ

Tues Seudristion	Results	Urits	Test Method
ಸರ್ವಿ ಭಕಕರ್ವರ ಚಿತ್ರವಿಂದಾರಿಗೂ by ಒ <mark>(b) (4)</mark> .ನ ೯೨೭೦	5/39		EPA # 8010
d-Otonioropenzene	1. 100	ug/1	
?-Dicalorocenzene	. : )C	ug/1	
.+-G.chicropenzene	4 100	ug/1	
Eromoform	₹ 160	ug/1	
Caroum Tetrachloride	< 100	ug/1	
19.10rupenžene	< 100	ug/1	
Dioromothicromethane	₹ 100	ug. 1	
Encapa, and promethane	: 100	ug/1	
iniordeinare 1	5 00	ug/1	
CH1010fCfm	6.190	ug/1	
: :-D:cnlorosthane	» 로 학	ug. 1	
: 2-0.c/larbethana	. 100	ug/1	
: t-Dichleroethene	1190	uç. 1	
i-i:anibroarcoane	7.100	ug/l	
1:5-1.1-0:chioropropane	< 100	ug/1	
Trans-: 3-6:chloroprosens	< 100	ug/1	
Biomometrane (Methyl Bromide)	4 100	ug/1	
Inic paethane (Methyl Unioride)	: 100	ug/1	
setrylede (niorice	152	ug/1	
: (,1,1-Tetraghlorostmane	SEE PCE	ug/1	
Tetrachicrosthere (PCE)	102	<b>ե</b> ₫/1	
Trans-1,2-Dicalorcethene	323	Jg/1	
1.1.1-Tricalcrostname .	16500	ug/1	
:.:.E-Tr:cnlordetname	< 1G0	Jg/1	
Frienlordstrene (TCE)	48906	1971	
Trichluro-luoromethane	< :60	ug/1	•
vinvl Inforias	< + C O	ug/1	

A BLANK CONTAINED & SIPPE METHYLENE CHLORICE, THIS IS ECCIVALENT TO C.ament USO UGZE IN THIS SAMPLE. BASED ON : TO 100 DILUTION



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS BCM Eastern: Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 1945 215-825-3800

FINAL REPORT

This is a tiral report.

The leguits have been unecked and authorized for release.

DAGE

CLIENT

CHRISTIANA METALS CORP

ATTN (b) (4)

SCIA MALL

30-6471-61

Jate

10/20/89

3CM #

00-6471-01

P.O.#

⊙rdar# .

30302

Bull Number Location

Client If

330390

:4W-X

Date Sampled

09/28/89

Date Received : 09/28/89 Sampler

Test Despriction Results Units Test Method Purgeable Halocartons by on 10/05/89 EPA # 8010 1,2-D:Chlcrobenzene 1000 u0/1 1.3-Dicaloropanzene < 1000 ug/1 1, -- Dichicropenzene 1000 ug/l Bromotorm < 1000 ug/1 Carbon Tetrachloride < 1000 ug/l Chloropenzene < 190C ug/1 < 1000 Dipromocnionomethans ug/l éromodionioromethane 1 1000 uq/1 Chicrostmans 1000 JQ/I Chlorotorm ug/1

1,1.2.2- Tetrachlorbethane Tetrachiorcathana (PCE) Trans-1.2-Dichloroethene 1.1,1-Trichlorosthane

t.1-0:chlordetmane

...2-0:colorsethane

.t-Granlordetnene

: E-Dichioropropane

Methylene Chloride

Cic-1.3-Dichloropropens

Trans- .3-Dichloropropene

Bromomethane (Methyl Bromide)

Calcromethane (Methyl Chloride)

:, :, ==TrichlorGethane Tr:chloroethene TCE)

Trianlaratidaremetriane vinyl Chioride

1000

4 1000

:000

1000

. 1000

2736

680000

ug/1 ug/1 ug/1 43/1 ug. I

ug/l

ug/1

ug/l

ug/1

ug/1

ug/l

ug/1 ug/l 4**0**/1

ug/l ua/1 ug. 1

A BLANK CONTAINED C & PPB METHYLENE CHLORIDE, THIS IS EQUIVALENT TO lomment. 2900 UG/L IN THIS SAMPLE, BASED ON 1 TO 1000 DILUTION



1850 Gravers Road - - Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO BOM Eastern Inc.
1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 1940 215-825-3800

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

SCM MALL

U0-3471-01

Date

10/20/89

BCM #

00-6471-01

₽.0.#

PAGE

. .

Grder# 🕛

30302

SCM Number :

Client ID

930391

MW-10A

Date Sampled

9/28/89

Date Received :

0 / 2 0 / 9 0

Sampler

BM ·

Fest Description	Results	Units	Test Method
Furgeable Halocarbons by (b) (4) on :0/05/8	19		EPA # 8010
1.2-Dichloropenzene	< 1	u <b>g</b> /1	
:.3-Bichlorcbenzene	<b>&lt; 1</b>	ug/1	
1,4-Dichloropenzene	< 1	ug/1	
Bromoform	< 1	ug/1	
Carbon Tetrachloride	<b>€ 1</b>	ug/l	
Chloropenzene	≼ 1	ug/1	40
Dibromochleromethane	v 1	ug/l	
Bromodichloromethane	`	ug/1	
Chlorosthane	< 1	ug/1	
Chloroform	< 1	ug/l	- F ( <b>b</b> .
1,1-Dichlorcethane	4.3	ug/l	
:.2-Dichloroethane	i. 1	ug/1	4.
1.1-Dichlordathene	6.5	ug/l	•
1.2-Dichloropropane	5 1	ug/1	1.00
IIS-1,3-Dichloropropene	<b>5</b> 1	ug/l	
Trans-1,3-Dichloropropene	( 1	ug/l	* *
Bromomethane (Methyl Bromide)	: 1	uç/i	1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Chloremethane (Methyl unloride)	< 1	u <b>g</b> /1	
Methylene Chloride	2.8	ug/l	
:,:,E.E-Tetrachloroethane	4 -	uç/1	
Tetrachloroethana (PCE)	¢ 1	ug/1	10 m
Trans-1,2-Dichloroethene	<b>9.9</b>	ug/l	
1.1,1-Trichlorosthans	84.4	u <b>g</b> /1	4 4 4 4
t,t,2-Trichloroethane	€ 1	ug/1	
Trichlerosthene (TCE)	244	ug/1	4. 76
frichiorofluoromethane	1	ug/1	2 27,1
Vinyl Chloride	i 1	ug/1	

comment:

M. SLANK CONTAINED C 8 PPE METHYLENE CHLORIDE



1850 Gravers Road Norristown, PA 19401 (215) 275-0281 PLEASE REMIT CHECKS TO BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 1942 215-825-3800

SINAL SEPORT

Trus is a final report.

The results have been snecked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

SCM MALL

00-3471-01

Date : 10.

10/20/89

00-6471-01

BCM #

FAGE

Order# :

30302

acM Number : Location :

Client if

930392

MW-10B

Date Sampled

09/28/89

Date Received .

09/28/89

Sampler

RM.

Forgeable Halocarbons by (b) (4) on 10/05/89  1.2-Dichloropenzene 1.3-Dichloropenzene 1.4-Dichloropenzene 2.1 ug/1 2.4-Dichloropenzene 3.1 ug/1 3romoform 3.1 ug/1 Chloropenzene 3.1 ug/1 3romoform 3.1 ug/1 3romoform 3.1 ug/1 3romogichloromethane 3.2 ug/1 3romogichloromethane 3.3 ug/1 3romogichloromethane 3.4 ug/1 3romogichloromethane 3.5 ug/1 3romogichloromethane 3.6 ug/1 3romogichloromethane 3.7 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1 3romogichloromethane 3.8 ug/1	log
i.a-Dichioropenzene	0
1.3-Dichipropenzene (1 ug/l 1.4-Dichipropenzene (1 ug/l 3romoform (1 ug/l Carpon Tetrachlorida (1 ug/l Chloropenzene (1 ug/l Dibromechloromethane (1 ug/l Bromogichloromethane (1 ug/l Chloroethane (1 ug/l Chloroethane (1 ug/l	L. 14g.
t.+-Dichloropenzene (1 ug/1 Bromoform (1 ug/1 Carbon Tetrachloride (1 ug/1 Chloropenzene (1 ug/1 Dibromochloromethane (1 ug/1 Bromogichloromethane (1 ug/1 Chloroethane (1 ug/1	*
### aromoform	
Carpon Tetrachloride (f ug/l Chloropenzene (f ug/l Dibromochloromethane (f ug/l Eromodichloromethane (f ug/l Chloroethane (f ug/l	10
Chloropenzene (1 ug/l Dibromochloromethane (1 ug/l Eromogichloromethane (1 ug/l Chloroethane (1 ug/l	
Dibromechloromethane 4 1 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3 4 ug/1 3	
Sromogichloromethane < 1 ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1 % ug/1	- 14-14
Chloroethane ← t ug/1	3.3
	3
	26
Fig.:-Dichloroethane 6.3 ug/1 %	7
,2-Dichloroethane ( 1 ug/1	<u>:</u> .
.s-Dichleroethene 4.9 ug/l	
1.2-Dichloropropane < 1 ug/1	
0:3-:,3-Dichloropropene < t ug/1	
Trans-1,3-Dichloropropene < 1 ug/1	
gromomethana (Mathyl Gromise) < 1 ug/1	J.L
Chloremethane (Methyl Chloride) (1 ug/1 4	- P
Metnylene Chloride ( 1 ug/1 )	ار به دد.
:,1,2,2-Tetrachloroethane SEE PCE ug/1	
Tetrachloroetneme (PCE) 1.0 ug/1	
Frans-1,2-Dichlorosthens 14.2 ug/1	
:,:,:-Trichloroethane f18 ug/1 g	1.17
t.f.2-Trichloroethane vit ug/1 🖑	
Fr:cnloroethene (TCE) 227 ug/1	
Trichlorofluoromethane (1 ug/1	- (
rinyi Chiorida 1.5 ug/l	

Dommant.

M. BLANK CONTAINED 3.8 PPB METHYLENE CHLORIDE



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

Final REPORT

This is a final report.

We results have been checked and authorized for release.

PAGE

CLIENT

CHRISTIANA METALS CORP.

ATTN: (b) (4)

SCM MALL

00-6471-01

Cate

10/20/89

SCM #

30-6471-01

₽.0 ≒

Order# :

30302

BCM number

Cliant ID

930393

Lucation

**₩₩-11** 

Date Sampled :

09/28/89

Date Received :

09/28/89

Samplac

Test description	Results	Units	Tast Method
Purgeable Halobarbons by (b) (4) on 1076	35/89	***	EPA # 8010
t.2-0:Cnloropanzene	< 100	ug/1	
::3-D:cnloropenzene	< 100	ug/l	
:.4-Dichloropenzene	< 100	ug/1	٠٠ والم
aromoform	.⊀ 100	ug/l	ंस्र्ये. ४ - च=
Jarbon Tetrachloride	< 100	ug/1	
Cniprobenzene	₹ 100	ug/l	
Dipromochioramethane	₹ 100	ug/1	
enshipmonethane	< 100	ug/1	
Chloroethane	< 100	ug/l	
Chloroform	₹ 100	ug/I	
:,:-Dichicroeth <b>ane</b>	711	ug/l	
1.2-0:cnloroethane	100	ug/1	
i.t-Dichloroethene	834	ug/1	
'.Z-Dichloroprop <b>ane</b>	4 100	ug/1	
Cis-1.3-Dichloropropane	< 100	ug/1	
Trans-1,3-Dichloropropene	₹ 190	ug/1	
aromomethane (Methyl Bromide)	< :00	ug/l	
Chioromethane (Methyl Chioride)	₹ 100	ug/l	
Machylana Chlorida	237	JG/1	
1,1,2.2-Tetrachloroetrane	100	ug/l	
Tetrachloroethene (PCE)	· · · 00	u <b>g</b> /i	
Trans-1 2-Dichlorbethene	2170	ug/1	
1,1,1-Trichloroethane	19600	nā, J	
1,1,2-Trichlorostmane	₹ 100	uç/l	
Trickloroethene (TGE)	15500	ug/1	
Trichlorofluoromethane	€ 100	ug/l	
vinyl Chloride	< 100	ug/l	

Comment

4. SLANK CONTAINED & 8 PPB METHYLENE CHLORIDE THIS IS EQUIVALENT TO 280 UG/L IN THIS SAMPLE, BASED ON : TO 100 DILUTION



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: BCM Eastern Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

PAGE

FINAL BEFORT

This is a final caport.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Date

BCM #

10/20/89

00-6471-01

P.O.#

Order# : 30302

BCM numper . Location

Ölient ID

930394

14W-12

Date Sampled :

09/28/89

Date Received :

09/28/89

Sampler.

Test Description	Results	Units	Test Method
Purgeable Halocarbons by (b) (4) on 10/05/8	10		EPA # 8010
7,2-Dichloropenzene	< 1	ug/1	
1,3-Dichloropenzene	₹ 1	ug/1	75.624
1,4-Dichlorobenzene	Ĉ i	ug/l	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s
Bromoform	₹ 1	ug/l	$T_{T_{i}} = \int_{0}^{\infty} dt$
Carton Tetrachloride	<u>``</u>	ug/1	
Cnloropenzene	₹ 1	ug/l	'
Dipromochloromethane	<u> </u>	ug/1	
Srcmogicaloromethane	< 1	ug/l	
Chloroethane	<u> </u>	ug/1	
Chloroform	<del>`</del>	ug/l	
1.1-Dichloroethane	12.0	ug/l	
1.2-Dichlorcethane	( 1	ug/l	
1,2-01chloroethane	53.1	ug/1	
;,2-01chloropropane	√ 1	ug/1	
Sis-1,3-Dichloropropene	<u> </u>	ug/1	
Trans-1,3-Dichloropropene	₹ 1	ug/1	
Bromomethane (Methyl Bromide)	₹ 1	ug/l	
Chloromethane (Methyl Chlorida)	<b>(1</b>	ug/l	
Methylene Chloride	<u> </u>	ug/l	
1.1.2.2-Tetracrioroethane	SEE PCE	-	
Tetrachloroethene (PCE)	7.5	ug/l	
	49.5	ug/1	-
Trans-1,2-Dichloroethene	69.5 425	ug/1	
1.1,1-Trichloroethane		ug/1	
1,1.2-Trichloroethane	< 1 	ug/1	•
Trianlorostnene (TCE)	3150	ug/l	
Trichlorofluoromethane	<u> </u>	ug/1	
Vinyl Chloride	15.ô	ug/l	

BLANK CONTAINED 2.8 PPB METHYLENE CHLORIDE Comment



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS 1 BCM Eastern Inc. : 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA-19462 215-825-3800

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

PAGE

CLIENT

CHRISTIANA METALS CORP

Date

10/20/89

ATTN: (b) (4)

BCM #

00-6471-01

SCM MALL

P.O.#

00-6471-01

Order# :

30302

BCM Number :

930395

Date Sampled :

09/28/89

Location MW-13 Client 15

Date Received .

09/28/89

- 1010 AN TOTAL

Sampler

Test Description	Results	Units Test M	ethod
Purgeable Halocarpons by (b) (4) on 10/55	5/69	EPA # (	8010
1,2-Dichlorobenzene	< 10	ug/1	<del> </del>
1,3-Dichloropenzene	< 10	ug/l	
1,4-Dicalorobenzene	< 10	ug/1	
Bromoform	< 10	ug/1	
Carbon Tetrachloride	····· < 10	ug/1	n restroit
Chlorobenzene	< 10	ug/1	الله والمدر
Dipromochloromethane	< 10	ug/I	
Bromod:chloromethane	< 10	ug/l	
Chloroethane	< 10	ug/l	
Ch1oroform	< 10	ug/l	2 1 E.
1,1-Dichloroethane	₹ 10	ug/1	
1,2-Dichloroethane	< 10	ug/1	
1.1-Dichloroethene	22.6	ug/l	
1,2-Dichloropropane	< 10	ug/1	
Cis-1,3-Dichloropropene	₹ 10	ug/1	
Trans-1.3-Dichloropropene	< 10	ug/l	
Bromomethane (Methyl Eromide)	< 10	ug/l	
Chloromethane (Mathyl Chloride)	< 10	ug/1	
Methylene Chloride	19.2	ug/l	4.14
1.1,2,2-Tetrachloroethane	₹ 10	ug/1	- CA.
Tetrachlorostmens (PCE)	< 10	ug/l	
Trans-1,2-DichlorGethene	12.3	ug/l	
1.1,1-Trichloroethane	490	ug/l	
1,1,2-Trichloroethane	< 10	ug/1	
Trichlorcetnene (TCE)	863	ug/1	
Trichlorofluoromethane	₹ 10	ug/1	
Vinyl Chioride	< 10	ug/l	

Comment:

M. BLANK CONTAINED 2.8 PPB METHYLENE CHLORIDE. THIS IS EQUIVALENT TO 28 UG/L IN THIS SAMPLE, BASED ON 1 TO 10 DILUTION



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: BCM Eastern Inc.
1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

PAGE

FINAL REPORT

Tais is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

30-6471-01

Order# :

Date

10/20/89

00-6471-01

BCM # F.O.#

30302

BCM number :

iant ID

\$20396

Location : Mw-14

Date Sampled : Date Received :

09/28/89 09/28/89

Sampler

Test Description	Results	Units Test	Method
Furgeable Halocarpons by (b) (4) on 10/05	5/89	EPA	# 8010
1.2-Dichloropanzane	< 10	ug/l	**** <b>*</b> ** <b>*</b>
1,3-Dichloropenzene	< 10	ug/l	
1,4-Dichloropenzene	€ 10	ug/l	
Bromoform	< 10	ug/l	
Carpon Tetrachloride	· < 10	ug/1	· · · · · · · · · · · · · · · · · · ·
Chloropenzene	< 10	ug/l	
Dibromochlorometname	< 10	ug/1	4
Bromodichloromethane	< 10	ug/1	
Chlorosthane	< 10	ug/1	
Chicroform	< 10	ug/l	
i,!-Dichlorpethane	35.9	ug/1	
1,2-Dichloroethane	< 10	ug/1	
1,1-Dichloroethene	229	ug/l	
1,2-D:cnloropropane	10	ug/l	
Cis-1,3-Dicmloropropene	< 10	ug/1	
Trans-1,3-Dichloropropene	< 10	ug/l	
Bromomethane (Methyl Bromide)	< 10	ug/l	
Chloromethane (Methyl Chloride)	< 10	ug/l	
:48thylene Chioride	16.7	ug/l	
1.1.2,2-Tetrachloroethane	SER PCE	ug/1	
Tetrachloroethene (PCE)	31.3	ug/l	
Trans-1,2-Dichloroethene	140	ug/l	
1.1,1-Trichloroethane	3930	ug/l	
1,1,2-Trichloroethane	< 10	ug/l	
Trichloroethene (TCE)	13800	ug/1	
Tr:chlorofluoromethane	< 10	ug/l	
Vinyl Coloride	< 10	ug/l	

Comment:

M. BLANK CONTAINED 2.3 PPB METHYLENE CHLORIDE. THIS IS EQUIVALENT TO 29 UG/L IN THIS SAMPLE, BASED ON 1 TO 10 DILUTION



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS 1 **BCM Edition Inc.** 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

9.0.#

Date

BCM #

PAGE

10/20/89

00-6471-01

Order# :

30302

BCM Number : Location

Client ID

930397

MW-15

Date Sampled : '09/28/89

09/28/89

Date Received :

Sampler

Test Description		Results	Units	Test Method
Purgeable Halocarbons by J. (b) (4) on 10/06/89	-			EPA # 8010
1,2-Dichloropenzene	(	1 ,	ug/1	
173-Dichlorobenzene	<	1	ug/l	
1.4-Dichloropenzane	<	1	ug/1	',
#romoform	<	<b>f</b> .	ug/1	
Carbon Tetrachloride		1	ug/l	
Chloropenzene	<	1	ug/l	
Dipromocnioromethane	<	1	ug/1	*
Bromogichlorcmethane	<	1	ug/l	
Chlorpethane	<	1	ug/l	
Chloroform		4.9	ug/l	.40
1,1-Dichloroethane		66.4	ug/l	
1/2-Dichloroethane	<b>\$</b>	1	ug/l	
t,1-D:Chloroethene		789	ug/l	
1.2-Dichloropropane	×	1	ug/l	
Cis-:,3-Dichloropropene	<	1	ug/l	
Trans-1,3-Dichlcropropene	ζ.	1	ug/1	
ercmomethane (Metnyl Brom:de)	<	1	ug/l	
Chipromethane (Methyl Chioride)	ς.	1	ug/l	
Methylene Chloride	<	1	ug/l	
1.1.2.2-Tetrachloroethane		SEE PCE	ug/l	
Tetrachloroethene (PCE)		97.6	u <b>g</b> /1	
Trans-1,2-Dichlorosthene		446	ug/l	
1,1.1-Tr:chloroethane		10100	ug/1	
1,1,2-Trichloroethane	<	1	ug/l	
Trichloroethene (TCE)		116000	ug/l	
Trichlorofluoromethane	ζ.	1	<b>ug/1</b>	
/invl Chloride	<	1	ug/l	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: BCM Equipm Inc. 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19482 215-825-3800

FINAL REPORT

This is a final report.

The results have been checked and authorized for release

PAGE :

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

SOM MALL

00-6471-01

Date

10/20/89

BCM #

00-6471-01

P.C.# :

Order# 30302

acm number

Location .

930398 MW-16

Trienlordethene (TCE)

Vinyl Chiorida

Trichlorofluoromethane

Date Sampled : 09/28/89

Date Received :

ug/1

ug/1

ug/1

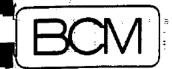
09/28/89

"Quant 10			SAMD)er	
Tast Description		Results	Units	Test Method
Purgeable Halocarbons by (b) (4) on 10/06/89				EPA # 8010
1.2-Dichloropenzene	<	ì	ug/1	
1,3-Dichloropenzene	<	1	49/1	
t.4-Dichloropenzene	<	1	ug/I	
Bromoform	<	1	ug/1	
Carbon Tetrachloride	ζ.	1	ug/l	
Chlorobenzene .	<	1	ug/l	
Dipromocnlorcmethane	<	1	ug/1	
Bromodicnloromethane	<	1	ug/l	
Chloroethane .		5.7	ug/1	
Chloroform	•	1	ug/1	
1,1-51chlordethana		265	ug/1	
1,2-Dichloroethane	<	1	ug/1	
_ 1,1-Dichicroethene		103	u <b>g</b> /1	
1,2-Dichloropropane	<	f ·	ug/1	
Cis-1,3-Dichloropropene	<	1	ug/l	
Trans-1,3-Dichloropropens	<	1	ug/1	
Bromomethane (Methyl Bromide)	<	1	ug/1	
Chloromethane (Methyl Chloride)	•	1	ug/l	
Methylene Chloride	<	1	u <b>ç</b> /1	
1,1,2,2-Tetrachloroethans		SEE PCE	u <b>g</b> /1	
Tetrachloroethena (PCE)		3.0	ug/l	
Trans-1,2-Dichlorgethene		110	ug/l	
1,1,1-Trichloroethane		1320	ug/1	
1,1,2-Tr:cnicrosthane	<	1	. ug/l	
· · · · · · · · · · · · · · · · · · ·				

1147

< 1

< 1



1850 Gravers Road Norristown, PA 19401 (215) 275-0281 PLEASE REMIT CHECKS TO:
BCM Scalern Inc.
1 PLYMOUTH MEETING
PLYMOUTH MEETING, PA 19462

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Date

PAGE

10/20/89

3CM # :

00-6471-01

P.Q.* :
Order# :

30302

BCM number :

Location

Client ID

930399

: TRIP BLANK

Date Sampled : Date Received :

09/28/89

Sampler

BM

Test Description Units Test Method Results Purgeable Halocarbons by on 10/06/89 EPA # 8010 1.2-Dichloropenzene < 1 ug/l 1,3-Dichlorobenzene ug/1 1;4-Dichlorocenzene ug/l Bromoform ug/1 Carbon Tetrachloride < 1 ug/l Chloropanzana ug/1 Dipromochloromethane ug/1 **Brcmodichloromethane** ug/1 Chloroethane ( 1 ug/l Cnicroform ug/1 1,1-Dichloroethane ug/1 1,2-Dichloroethane ug/1 1,:-Dichloroethene ( 1 ug/l 1.2-Dichloropropane ug/l Cis-1,3-Dichloropropene ug/l Trans-1,3-Dichloropropene ug/1 Bromomethane (Methyl Bromide) ug/1 Chloromethane (Methyl Chloride) < 1 ug/1 Methylene Chloride 1.2 uq/1 1.1.2.2-Tetrachlcroethane ( 1 ug/1 Tetrachloroethene (PCE) ug/1 Trans-1,2-Dichloroethene ug/1 < 1 1,1,1-Trichloroethane ug/l 1,1,2-Trichloroethane ug/1 **、 1** Trichloroethene (TCE) 12.7 ug/1 Trichlorofluoromethane : 1 ug/1 Vinvl Chloride ug/1

Comment: M. BLANK CONTAINED 2.4 PPB METHYLENE CHLORIDE



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT-CHECKS TO BCM Easternaine, ear se a 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

PAGE

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-0471-01

Order# :

Date Sampled :

10/20/89

BCM #

00-6471-01

P.O.# :

Date

30302

BCM Number :

Location

Client ID

930400

: FIELD BLANK

Date Received :

09/28/89

09/28/89

Sampler

Purgeable Hallocarbons by   1,2-Dichlorobenzene   1	Test Description (b) (4)	Results	Units	Test Method
1,2-Dichlorobenzene	Surgeable Hallocarpons by cn 10/06/89	<u> </u>		EPA # 8010
1,3-Dichloropenzene       ( † ug/l         1,4-Dichloropenzene       ( † ug/l         8romoform       ( † ug/l         Carbon Tetrachlorida       ( † ug/l         Chlorobenzene       ( † ug/l         Dibromochloromethane       ( † ug/l         Bromodichloromethane       ( † ug/l         Chloroform       ( † ug/l         Chloroform       ( † ug/l         1,1-Dichloroethane       ( † ug/l         1,2-Dichloroethane       ( † ug/l         1,2-Dichloroptopane       ( † ug/l         Cis-1,3-Dichloropropene       ( † ug/l         Trans-1,3-Dichloropropene       ( † ug/l         Bromomethane (Metnyl Bromide)       ( † ug/l         Chloromethane (Metnyl Chloride)       ( † ug/l         Metnylene Chloride       ( † ug/l         1,2-Tetrachloroethane       ( † ug/l         1,1,2-Tetrachloroethane       ( † ug/l         1,1,1-Trichloroethane       ( † ug/l         1,1,2-Trichloroethane       ( † ug/l         1,1,1-Trichloroethane       ( † ug/l         1,1,1-Trichloroethane       ( † ug/l         1,1,1-Trichloroethane       ( † ug/l         1,1,2-Trichloroethane       ( † ug/l         1,1,1-Trichloroethane       ( † ug/l <td></td> <td><b>〈 1</b></td> <td>ua/1</td> <td></td>		<b>〈 1</b>	ua/1	
1,4-Dichlorobenzene			_	
8romoform         ( 1	. •			
Carbon Tetrachlorida		- •	-	
Chlorobenzene         ( 1			•	
Dibromochloromethane         (1 ug/1           Bromogichloromethane         (1 ug/1           Chloroethane         (1 ug/1           Chloroform         (1 ug/1           1:1-Dichloroethane         (1 ug/1           1:2-Dichloroethane         (1 ug/1           1:2-Dichloroptopane         (1 ug/1           1:2-Dichloroptopane         (1 ug/1           Cis-1,3-Dichloroptopane         (1 ug/1           Bromomethane (Methyl Bromide)         (1 ug/1           Bromomethane (Methyl Bromide)         (1 ug/1           Chloromethane (Methyl Chloride)         (1 ug/1           Methylene Chloride         (1 ug/1           1:1,2,2-Tetrachloroethane         (1 ug/1           Trans-1,2-Dichloroethane         (1 ug/1           1:1,1-Trichloroethane	<del></del>		_	
Bromodichloromethane         ( † ug/l           Chloroethane         ( † ug/l           Chloroform         ( † ug/l           1-1-Dichloroethane         ( † ug/l           1,2-Dichloroethane         ( † ug/l           1,1-Dichloroethane         ( † ug/l           1,2-Dichloropropane         ( † ug/l           Cis-1,3-Dichloropropene         ( † ug/l           Trans-1,3-Dichloropropene         ( † ug/l           Bromomethane (Methyl Bromide)         ( † ug/l           Chloromethane (Methyl Chloride)         ( † ug/l           Methylene Chloride         1.2 ug/l           1.1,2-Tetrachloroethane         ( † ug/l           Trans-1,2-Dichloroethane         ( † ug/l           1,1,1-Trichloroethane         ( † ug/l           1,1,1-Trichloroethane         ( † ug/l           1,1,2-Trichloroethane         ( † ug/l           Trichloroethane         ( † ug/l <td>•</td> <td>• •</td> <td>•</td> <td></td>	•	• •	•	
Chloroetnane       ( 1	•	· •	_	
Chloroform		- •	_	
1.1-Dicnloroethane	***			
1,2-Dichloroethane       (1 ug/1         1,1-Dichloroethane       (1 ug/1         1,2-Dichloropropane       (1 ug/1         Cis-1,3-Dichloropropane       (1 ug/1         Trans-1,3-Dichloropropane       (1 ug/1         Bromomethane (Methyl Bromide)       (1 ug/1         Chloromethane (Methyl Chloride)       (1 ug/1         Methylene Chloride       1,2 ug/1         1,1,2,2-Tetrachloroethane       (1 ug/1         Tetrachloroethane       (1 ug/1         Trans-1,2-Dichloroethane       (1 ug/1         1,1,2-Trichloroethane       (1 ug/1         Trichloroethane       (1 ug/1         Trichlorofluoromethane       (1 ug/1			-	
1,1-Dichloroethene (1 ug/l 1,2-Dichloropropane (1 ug/l Cis-1,3-Dichloropropene (1 ug/l Trans-1,3-Dichloropropene (1 ug/l Bromomethane (Methyl Bromide) (1 ug/l Chloromethane (Methyl Chloride) (1 ug/l Methylene Chloride (1,2 ug/l 1,1,2-Tetrachloroethane (1 ug/l Trans-1,2-Dichloroethene (PCE) (1 ug/l 1,1,1-Trichloroethane (1 ug/l 1,1,2-Trichloroethane (1 ug/l Trichloroethane (1 ug/l Trichloroethane (TCE) (1 ug/l Trichlorofluoromethane (1 ug/l Trichlorofluoromethane (1 ug/l Trichlorofluoromethane (1 ug/l	•	"	_	
1,2-Dichloropropane			-	
Cis-1,3-Dichloropropene (1 ug/l Trans-1,3-Dichloropropene (1 ug/l Bromomethane (Methyl Bromide) (1 ug/l Chloromethane (Methyl Chloride) (1 ug/l Methylene Chloride 1.2 ug/l 1.1,2,2-Tetrachloroethane 1 ug/l Tetrachloroethane (PCE) (1 ug/l Trans-1,2-Dichloroethane (1 ug/l 1,1,1-Trichloroethane (1 ug/l 1,1,2-Trichloroethane (1 ug/l Trichloroethane (TCE) 3.5 ug/l Trichloroffluoromethane (1 ug/l		<b>( 1</b>	_	
Trans-1,3-Dichloropropene (1 ug/1 Bromomethane (Methyl Bromide) (1 ug/1 Chloromethane (Methyl Chloride) (1 ug/1 Methylene Chloride (1.2 ug/1 1.1,2,2-Tetrachloroethane (1 ug/1 Tetrachloroethane (PCE) (1 ug/1 Trans-1,2-Dichloroethane (1.1,1-Trichloroethane (1 ug/1 1,1,2-Trichloroethane (1 ug/1 Trichloroethane (TCE) (1 ug/1 Trichlorofluoromethane (1 ug/1 Trichlorofluoromethane (1 ug/1 Trichlorofluoromethane (1 ug/1	·	(1	-	
3romomethane (Methyl Bromide)4 1Chloromethane (Methyl Chloride)4 1Methylene Chloride1.21.1,2,2-Tetrachloroethane4 1Tetrachloroethane (PCE)4 1Trans-1,2-Dichloroethane4 11,1,1-Trichloroethane4 11,1,2-Trichloroethane4 11,1,2-Trichloroethane4 11,1,2-Trichloroethane4 11,1,2-Trichloroethane4 11,1,2-Trichloroethane4 11,1,2-Trichloroethane4 11,1,2-Trichloroethane4 11,1,2-Trichloroethane4 11,1,2-Trichloroethane4 11,2-Trichloroethane4 11,1,2-Trichloroethane4 11,2-Trichloroethane4 11,1,2-Trichloroethane4 11,2,2-Trichloroethane4 11,2,2-Trichloroethane4 11,2,2-Trichloroethane4 11,2,2-Trichloroethane4 11,2,2-Trichloroethane4 11,2,2-Trichloroethane		( 1	-	
Chloromethane (Methyl Chloride)  Methylene Chloride  1.1.2 ug/l  1.1.2.2-Tetrachloroethane  1.2 ug/l  Tetrachloroethane (PCE)  Trans-1,2-Dichloroethane  1.1.1-Trichloroethane  1.2 ug/l  1.1.1-Trichloroethane  1.2 ug/l  1.1.1-Trichloroethane  1.3 ug/l  1.1.1-Trichloroethane  1.4 ug/l  1.7.1.2-Trichloroethane  1.5 ug/l  Trichloroethane  1.6 ug/l  Trichlorofluoromethane  1.7 ug/l	·	< 1		
Methylene Chloride 1.1,2,2-Tetrachloroethane 1.1 ug/l Tetrachloroethane (PCE) < 1 ug/l Trans-1,2-Dichloroethane < ' ug/l 1,1,1-Trichloroethane < 1 ug/l 1,1,2-Trichloroethane < 1 ug/l Trichloroethane (TCE) 3.5 ug/l Trichlorofluoromethane < 1 ug/l	• • • • • • • • • • • • • • • • • • • •	( 1	-	
1.1,2,2-Tetrachloroethane Tetrachloroethane (PCE)	·	1.2	_	
Tetrachloroethene (PCE) < 1 ug/l Trans-1,2-Dichloroethene < ' ug/l 1,1,1-Trichloroethane < 1 ug/l 1,1,2-Trichloroethane < 1 ug/l Trichloroethene (TCE) 3.5 ug/l Trichlorofluoromethane < 1 ug/l	• • • •	. 1	-	
Trans-1,2-Dichlorosthene < ' ug/l 1,1,1-Trichlorosthane < 1 ug/l 1,1,2-Trichlorosthane < 1 ug/l Trichlorosthane (TCE) 3.5 ug/l Trichlorofluoromethane < 1 ug/l		< 1		
1.1.1-Trichloroethane < 1 ug/l 1.1.2-Trichloroethane < 1 ug/l Trichloroethane (TCE) 3.5 ug/l Trichlorofluoromethane < 1 ug/l		<b>'</b> '	ug/l	
1,1,2-Trichlorgethane <-1 ug/1 Trichlorgethane (TCE) 3.5 ug/1 Trichlorgfluoromethane <-1 ug/1		< 1	_	
Trichloroethene (TCE) 3.5 ug/l Trichlorofluoromethane < 1 ug/l		₹ - 1	_	
Trichlorofluoromethane < 1 ug/1	• • • • • • • • • • • • • • • • • • • •	3.5	_	
		< 1	_	
		<b>〈 1</b>	ug/l	



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

43,000

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

PAGE :

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Date : 10/20/89

BCM # : 00-6471-01

P.Q.# :

Order# :

30302

SCM Number : 930400

lient ID

41414 00

LOCALION : FIELD BLANK

Date Sampled : 09/28/89

Date Received : 09/28/89

Sampler

Tast Description

Results

Units Test Method

3.5

_ . . . . . . . .

Certified by :

BCM Lacoratory Director

Lab Certifications.

PA - 46-007 AL - 40300

NJ - 77175

iiD - 136

EPA BULK ASBESTOS QC - 3339



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS TO: BCM Eastern Inc. - ..... 1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 215-825-3800

PAGE :



FINAL REPORT

This is a final report. The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Date

: 09/01/89

BCM # :

00-6471-01

P.O.# :

Order# : 29596

BCM Number : 926126

lient ID

Location B-10-6.5 Date Sampled : 08/18/89

Date Received :

08/18/89

Sampler

Test Description

Results

Units Test Mathod

Comment: All applicable results for this sample reported on dry weight basis

t k turk ji navoren

<del>milian ar in til</del> - X* : : :

質りようぎしたでんた。 ・・

grade Leading

43 1 Fig. 26.

Committee of the committee of

-118-

PAYMENT IS DUE UPON RÈCEIPT OF INVOICE. PAST DUE AMOUNTS OVER 30 DAYS WILL BE SUBJECT TO AN INTEREST RATE OF 18% PER ANNUM.



1850 Gravers Road Norristown, PA 19401 (215) 275-0281 PLEASE REMIT CHECKS TO BCM Bostom Inc.
1 PLYMOUTH MEETING PLYMOUTH MEETING, PA 19462 PG 15-625-3800

PAGE

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: J((b)(4)

BCM MALL

00-6471-01

1-01

Date

09/01/89

00-6471-01

BCM # P.O.#

Order# :

29596

SCM Number : Location :

926127

B-11-1.5

Date Sampled :

08/18/89

Date Received :

08/18/89

Client ID

Total Solids

**Sampler** : ES

Test Description	Results	Units Test Method
Purgeable Halocarbons by (b) (4) on 08/21/89		EPA # 8010
1,2-Dichlorobenzene	< 0.0119	mg/kg
1,3-Dichlorobenzene	< 0.0119	mg/kg
1,4-Dichloropenzene	< 0.0119	mg/kg
Bromoform	< 0.0119	mg/kg
Carbon Tetrachloride	< 0.0119	mg/kg
Chlorobenzene	< 0.0119	mg/kg
Dibromochloromethane	< 0.0119	mg/kg
Bromogichloromethane	< 0.0119	mg/kg
Chloroethane	( 0.0119	mg/kg
Chloroform	< 0.0119	mg/kg
1,1-Dichloroethane	< 0.0119	mg/kg
/ 1,2-Dichlorosthans	< 0.0119	mg/kg
1,1-Dichloroethene	< 0.0119	mg/kg
1,2-Dichloropropane	< 0.0119	mg/kg
Cis-1,3-Dicnloropropene	< 0.0119	mg/kg
Trans-1,3-Dichloropropene	< 0.0119	mg/kg
Bromomethane (Methyl Bromide)	< 0.0119	mg/kg
Chloromethane (Methyl Chloride)	< 0.0119	mg/kg
Methylene Chloride	< 0.0119	mg/kg
1,1,2,2-Tetrachloroethane	< 0.0119	mg/kg
Tetrachloroethene (PCE)	< 0.0119	mg/kg
Trans-1,2-Dichlorosthene	< 0.0119	mg/kg
1,1,1-Trichloroethane	< 0.0119	mg/kg
1.1.2-Trichloroethane	₹ 0.0119	mg/kg
Trichloroethene (TCE)	0.0226	mg/kg
Trichlorofluoromethane	< 0.0119	mg/kg
Vinyl Chloride	< 0.0119	mg/kg
Solids, Total (%) by (b) (4) on 08/30/89		Std. Mtd. 209F

84.2



1850 Gravers Road Norristown, PA 19401 (215) 275-0281

PLEASE REMIT CHECKS 1 BCM Eastern Inc. 1 PLYMOUTH MEETING PA 19982 PLYMOUTH MEETING, PA 19982 215-825-3800

PAGE

FINAL REPORT

This is a final report.

The results have been checked and authorized for release.

CLIENT

CHRISTIANA METALS CORP

ATTN: (b) (4)

BCM MALL

00-6471-01

Date BCM # :

09/01/89 00-6471-01

P.O.# :

Order# : 29596

BCM Number : 926127

Location : 8-11-1.5

Date Sampled :

08/18/89

Date Received : 08/18/89

ì

Client ID :

Sampler

Test Description

Results

Units Test Method

Comment: All applicable results for this sample reported on dry weight basis

120 -





#### APPENDIX F

BCM INTEROFFICE CORRESPONDENCE DOCUMENTING SOIL SAMPLE ANALYTICAL PROCEDURES FOR SAMPLES OBTAINED FROM BORINGS B-5 and B-6



## INTEROFFICE

TO:

(b) (4)

cc: (P)

(b) (4) (b) (4) DATE:

January 12, 1990

FROM:

(b) (4)

OMR

SUBJECT:

Christiana Metals

BCM Project No. 00-6471-01 BCM Lab Order No. 29200

The purpose of this memo is to provide additional explanation for the results reported in August for the above referenced order. Seven soil samples, a trip blank, and a field blank were analyzed for purgeable halocarbons by gas chromatograph in accordance with EPA Method No. 8010. In each of the samples where volatile organic compounds were detected, the concentrations are reported as greater than a specific value (e.g. 1,1-dichloroethene >10 mg/kg).

Normally, a specific concentration, not a greater than concentration, Each of the samples was collected on 8/1/89 and is reported. received and logged in at the laboratory that same day. Each of the samples were initially analyzed on 8/3 with a 1 to 10 (1/10) The concentrations detected were outside the linear range of the instrument calibration. This meant that the results for these analyses were qualitative only and that the concentrations detected were less than those actually present in the samples. Each of these subsequently run 2-6 additional times at varying samples was dilutions in order to obtain results within the range of instrument Attached is a table listing the dates and dilutions for calibration. the initial and subsequent tests for each sample. In each of these cases no concentrations above the level of detection were detected. As we know the samples initially contained several volatile organic compounds, our conclusion regarding the later runs was that disturbance of the samples by sample container opening and the volatile nature of the compounds resulted in the volatilization of the compounds from the samples.)

Review of the initial sample chromatograms indicates that the compound identifications are correct. These results are consistent with other data from the site. Consequently, the results reported can be used so long as it is understood that the concentrations are greater than reported.

Should you have any questions or require additional information, please contact either (b)(4)(b)(4)(b)(4) or me.

BOM

## INTEROFFICE

(b) (4)
cc
(b) (4)

DATE: 1/8/50

FROM:

(b) (4)

SUB JECT:

Chrisgian Models

Oras 29200

Attached is a copy of a report from Engent on which we had to qualify
The Data. The project manager needs a brief momo explaining why the
samples could not be revent they were but the concentrations were gone-vokilitally
I need to see the file for this order well-the of Late reduction and
rerun attempt.

923863- Date: 8/3 8/4 8/17 923864-8/3 8/4 8/10 8/17 8/17 (HW-108-1.5) diluter : 1/0 500 1/0 (B-5-1.5) 1/0 500 1/50 1/1 50

93865 - 8/3 8/4 8/10 8/11 8/14 8/15 8/17 8/18 (Field 1) Grant 3/3 (B-5-35) 1/6 1/000 1/000 1/1 8/14 8/15 8/17 8/18 (Field 1) Grant 3/3

923866 - 8/3 8/4 8/1 8/1 8/1 8/1 8/18 923867-8/3 8/4 8/1 8/17 8/18 (B-5-65) 1/10 60 1/50 1/10 1/10

923868-5/3 8/4 8/10 8/11 8/17 8/18 923869-8/38/48/17 923870-8/14 (B6-1.5) 1/10 /500 /100 /100 /100 /100 (B6-5.5) 1/10 /1500 /100 (Tripstlmy) 1/1

Samply ran on 8/2 Ch //s dilution were overlanded, After that the Corresponding dilutions Shown Sample were clean. 8/11 reran from original soil again showed clean.